WITHDRAWN

POLITICS AND PESTICIDES

THE INCREDIBLE STORY OF BOONDOGGLING IN THE BUG WORLD

By

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TO

JANIE

Birth Deformed, Tragic, and Beloved

PREFACE

This is a message to California Governor Edmund G. Brown, Jr., to Dr. Tim Wallace, California Director of Food and Agriculture, to the California Legislature, to the United States Department of Agriculture, to the United States Congress, and to all who choose continuance of petrochemical agriculture or change to less dangerous methods of pest control.

The choices that promoted petrochemical agriculture and increased sale of pesticides were made previously and have developed into massive scandal both in the United States and in California; however, each year presents opportunity for change. The reforms requested by People's Lobby are reasonable and conform to scientific fact; they will benefit farmers, workers in agriculture, consumers of agricultural products, and housewives and home gardeners. Hopefully they will receive careful consideration.

Change in use of pesticides is obligatory because facts compel it; the only issue is the time. The target date for California is the spring of 1976. For scientific reasons, change must come at that season, for then life renews itself with pest and natural enemy in balance. However, in California those in authority must do much preliminary planning, and the time has come to begin this work. Members of the Legislature must become familiar with the issues and the science that lies behind them, hearings must be held by committees of the

Legislature, regulations must be drafted by the Director, and after hearings, given force of law. The Division of Biological Control urgently must be solicited to lend expertise to guide agriculture, and the Legislature must enact whatever legislation is necessary to give its scientists that leadership. The United States Department of Agriculture and the Congress of the United States must approach the problem in a similar manner.

I wish to express gratitude to those who have answered technical questions and especially to Dr. Asher K. Ota, Hawaiian Sugar Planters Association, for permission to include his admirable history of the entomology department, HSPA.

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INTRODUCTION

LIFE VERSUS MONEY

People's Lobby rejects as cynical and immoral the risk–versus–benefit measure of pesticide use. Counted in percentages, it conveys no picture of birds twitching in death agony, fish floating dead in rivers, or mankind dying of cancer; nor is benefit evenly divided, since in terms of money it flows only to sellers of pesticides and perhaps to those corrupt officials who traffic with them. Nor is the measure real, for its computation condones abuses by basing reasoning on an assumption. As soon as one grants this assumption that a small percentage of risk is tolerable, a thousand victims more or less become acceptable. With this we do not agree.

Before the Director of Agriculture, committees of the legislature, and the people of California, we bring the victims, then, to plead their case, and foremost among them is the unborn child, seldom admitted to any conference.

Let us imagine hearings before some committee of government that cares nothing for profits of any man, but considers only victims. Excluded from the meeting are scientists who deal only in short–term experiment, because the lives even of these victims extend beyond their calculations, and the life of humanity into infinity. As witnesses come the hidden children, those too pitiful or too monstrous to have part in life. Light burns low in

retarded minds; some cannot stand upon twisted limbs; others have stumbling speech: their lives have become accusation. This dwindling of the race is far more terrible than any holocaust.

I had such a child in my own family—my little niece Janie. She had a body made only for pain, a victim of cerebral palsy, with muscles so tight that she could speak only a few words, could not use her hands, and could not walk. She was the most severely handicapped spastic child that I have ever seen, and I have known many in the desolate search for guidance that all with such children take through clinics and hospitals. She was bound close to me in care and affection for eleven years. I shall tell her story, then, to give statistics humanity.

Janie had a mind which I believe was normal, for she could learn and remember. I have sat on the piano bench with letter cards on the music rack and have asked her to show me certain letters. She would turn her eyes to the proper letter, for she could not point. Although she learned a letter quickly, I did not persevere in teaching her, for it seemed so futile. What could a person with the physical development of a baby do with ideas, especially when so few know that mental development and physical handicap are not related? Therefore despair would halt the lessons, and I would end by amusing her with a story. I know that a normal mind in a crippled body only increases the tragedy.

Whatever her mental ability, she could be no more than a baby in action all her life. She had

about the balance of a five-month-old baby, she could not use her hands to eat, and she had to be lifted from bed to chair. A life so dependent craves affection, but affection so given is mixed with fear and despair. One never takes pleasure in watching a child's powers develop, as with a normal child. One always fears that the child's life will outrun one's own, and that others will not give tender care or even human consideration. This child so dear to me might seem to others a monster. A physical therapist put this premonition into words when she told me that a crippled child is cherished, but that the world has no place for a crippled adult. I learned that Janie was too disabled to receive consideration when I tried to enter her in an institution which is a show place in California for training handicapped children. Janie was not wanted, because she was considered a feeding problem, since she had tight throat muscles that interfered with swallowing. I remember the official full of polite excuses but impatient to turn to easier problems.

My friends and the social workers, to whom Janie was a case to be solved and put aside, exerted pressure to have her put into a state institution. I could not expect any special treatment for Janie, but if she had not been so handicapped, I would have let her go in despair, for I could not answer the neat arguments of the case worker. I resisted because I knew that she would be put to bed and kept there until her death. The spastic muscles, if unused, would tighten into rigidity; these muscles also ran internally, so that digestion and bodily

functions became difficult. By lifting her and letting her sit rather than lie prone, I had been able to stimulate activity in her body. If she must lie in bed with consequent loss of activity, I could not bear to think of the pain of those rigid muscles before death intervened. Janie had a body so malformed that only special care could keep her alive. It is a moot question whether she should have had her years prolonged, but I could not be the one to assign her to so slow and painful an end. So tragedy becomes a daily companion to one with a handicapped child.

I have certain unhappy memories of hospitals. Janie was afraid of nurses and hospitals, and that fear would tighten her muscles and make it difficult for nurses to give her food and water. I remember one hospital where she was dehydrated because of the problem of getting liquid past those tight throat muscles. I recall another hospital where nurses put restraining bonds across her body when she cried. When I came to her next morning, she was damp with perspiration and exhausted from fighting her bonds. A normal child might have been soothed to sleep with a kind word, but it is common to forget that the handicapped partakes of humanity; therefore, so often is care without imagination.

These experiences made it difficult for me to put Janie where she would need to conform to rules of an institution. How much suffering is contained in that phrase--the child does not institutionalize well. No normal child would be snatched without explanation from all people that he knows

and loves and placed with strangers; yet this is done with the handicapped, and all agree that this is the solution. Janie was without speech to let her wants be known. I could guess when she was hungry or thirsty, but would others care? If her physical needs were half neglected, who would care about the loneliness or despair of this child who had no future except pain? She would lie for hours and see only the walls of the hospital room; no people or sounds would give her pleasure. She had so little of life, and then she would have nothing. After an interval during which she must be left alone, according to the rules of the institution, to become accustomed to despair, I could visit her for short periods. These visits would only deepen the sadness, as if one spoke to a person already dead. I could not send Janie away, and I could not care for her indefinitely.

Thus I lived a problem that I found beyond solution; yet with the passing of days the affection that bound me to this tragic child deepened. When she slept at night, her child face was as gentle and dear as that of any other child. As the time to obey the command of the social worker came closer, cutting the bonds that bound us became impossible. I talked to the mother of another child with the same problem, but her boy was old enough to understand and had himself chosen to go,so that he would not be a burden to his mother. Thus a child was assuming the courage that few adults possess. He was making the decision to forego life itself for no offense except a useless body. The old and ill we do not treat thus, only the

young and helpless.

Janie died one morning in my arms. Death had set us both free.

There is no need to dwell upon this, since even I recognized that her death was not so great a tragedy as her life. I still see her gentle eyes, and feel the touch of her baby hands, not reaching like those of other children, but warm with life. When she lay in her coffin with her misformed body straightened and concealed, she had such beauty that I had a glimpse of the child that she might have been. This is what I mourn as memories crowd back.

As I study the indictment of poisons as mutagens, I wonder how many attractive girls will become mothers of defective children. How will they meet this problem? I remember one young mother of a retarded child who concealed herself and the child to brood about the tragedy. Others rush about seeking remedy and refusing to believe that there is no real cure for handicap except prevention of original injury to genes or to foetus. How will it be with children as victims multiply? If their care is now inadequate, how will it be in the future as others weary of the burden?

I may be asked to prove that my own child suffered because of poison. I can offer no definite or legal proof; I can say only that scientists are discerning reasons for handicap, and I have set down my own experiences to indicate the immensity of the tragedy. Cerebral palsy has two causes--a difficult birth damaging the brain or failure of the nervous system to form properly. The latter

might relate to poison.

Janie had another strange and terrible physical problem: at the age of three, cells in her ovaries began to grow wildly--incipient cancer, the doctor called it. He checked it by a major operation, an ordeal difficult for an adult. Why this disaster came I do not know, but something had happened when the child was conceived and nourished in her mother's body. It was as if a body unfit for human use tried to die many times.

* * *

Many wait at the door of this meeting attended only by the humane and the just. They cannot enter, because for them ringing cash registers drown pleas of humanity. Let them hearken to the words of Elizabeth Browning, "A child's sob in the darkness curses deeper than a strong man in his wrath."

INTRODUCTION

BASIC POLICY AS THE PEOPLE DESIRE IT

Chapter 1, Section 81001, 81001(a), and 81001(b) of Proposition 9, the Political Reform Act 1974, reads:

"The people of California find and declare as follows:

(a) State and local government should serve the needs and respond to the wishes of all citizens equally, without regard to their wealth;

(b) Public officials, whether elected or appointed, should perform their duties in an impartial manner, free from bias caused by their own financial interests or the financial interests of the persons who have supported them. . ."

Over 70% of the voters of California voted to establish this premise in 1974 by voting Proposition 9 into law.

HONESTY IN GOVERNMENT

The Director of Food and Agriculture has both administrative and legislative functions: as administrator, he presides over a numerous bureaucracy, and as lawmaker, after hearings, he makes regulations having force of law. In these hearings he need

consult no one and is sole judge of testimony. Even vital instructions in the Agriculture Code are written as wishes rather than law, so that he may use his own discretion. As an appointed official, he does not touch the people closely. Clothed thus with dictatorial power, an official may forget that he is an employee of the people.

An employee owes his loyalty to the man who hires him, and the employer's function is to observe and check or reward his employee. Since all the people of California cannot perform this duty, the public citizen must accept the obligation. People's Lobby, then, presents this study of the Department of Food and Agriculture, centering upon pesticide regulation.

CHAPTER I

ERADICATION VERSUS BIOLOGICAL CONTROL

People's Lobby, in its study of boondoggling in the Department of Food and Agriculture, has discovered an extraordinary system of funding, which is best described as musical chairs funding. By Section 224(2) of the Food and Agriculture Code, $1,000,000 is appropriated "for emergency detection, eradication, or research of agricultural plant or animal pests or diseases, during each fiscal year," and if unused, reverts to the County Departments of Agriculture. The Director of Food and Agriculture, then, expends this money without review by the Finance Committees of the Legislature. Items so funded cease to be emergencies in the following year, and leap into the Governor's budget funded in the usual manner from the general fund, where they usually remain for several years. Each year, then, administrators are motivated to look for new emergencies--a million dollars worth. Few administrators will take the alternative of permitting this money to go to the counties, since that would mean disbanding their bureaucracy and listing their workmen among the unemployed.

If all state government were so funded, there would be little use for the Finance Committees of the legislature, since all programs would be initiated and a bureaucracy hired without scrutiny of these committees or appropriate hearings. In the following year their deliberations would be always after the fact. When the Finance Committees finally are permitted to study the programs, they would encounter a law of government: no bureaucracy willingly self-destructs; instead, it increases its size and power. This legislation results in an emasculation of the legislative function, an astonishing surrender of power to the administrative officials of the state. Annual review and control of spending of tax money are central powers of the legislature, since expenditure of money determines both direction and policy of government, as well as the amount of the budget.

Very possibly the legislature was influenced to enact this unusual legislation by the thought that new pests might invade California and become menacing so quickly that the legislature might not have time to provide proper funding. An examination of the budgets for eradication in a typical period from 1952 through 1958, when the fund for emergency eradication did not exist, does not indicate that a million dollars would be required every year to deal with invading pests:

1951-1952

Beet leafhopper	$ 173,788
(emergency)	163,707

1951-1952(cont'd)

Mexican bean beetle	66,859
Oriental fruit fly survey	20,336
Cherry fly eradication	18,137
TOTAL	$ 335,293

1952-1953

Beet leafhopper	$ 329,579
Grapeleaf skeletonizer	68,007
Mexican bean beetle	40,332
Cherry fly eradication	15,046
TOTAL	$ 450,964

1953-1954

Beet leafhopper	$ 215,056
Grapeleaf skeletonizer	96,568
Mexican bean beetle	28,764
Hall's scale	66,214
Cherry fly	17,604
TOTAL	$ 424,224

1954-1955

Beet leafhopper	$ 210,443
Grapeleaf skeletonizer	48,076
Mexican bean beetle	23,685
Cherry fly	4,756

1954-1955(cont'd)

Hall's scale	$ 71,288
Mexican fruit fly	78,566
Khapra beetle	307,216
TOTAL	$ 744,010

1955-1956

Beet leafhopper	$ 234,803
Grapeleaf skeletonizer	18,290
Mexican bean beetle	23,229
Cherry fly	5,377
Hall's scale	46,524
Mexican fruit fly	61,856
Khapra beetle	449,550
TOTAL	$ 840,259

1956-1957

Beet leafhopper	$ 223,000
Hall's scale	22,937
Mexican fruit fly	75,340
Khapra beetle	179,122
Melon fly	137,472
TOTAL	$ 637,871

1957-1958

Beet leafhopper	$ 222,623
Hall's scale	28,086

1957-1958(cont'd)

Mexican fruit fly	$ 77,570
Khapra beetle	138,294
Melon fly	36,857
TOTAL	$ 503,430

First let us exclude the 1951-1952 budget, since no one knows whether any of the listed pests is included for the first time. Then, throughout all the years, exclude the beet leafhopper, since this is a perennial item, and not an eradication project. Of the six years remaining there were three without any new pests; therefore, if the million dollars had been available at that time it would not have been needed. Of the remaining three years, Hall's scale was an invader in 1953-1954,costing $66,214; 1954-1955 was a top year with the fruit fly and the Khapra beetle, making a total of $385,782; and in 1956-1957 the melon fly cost $137,472. Even allowing for inflation, there was only one year that would call for excessive allocation of money from an emergency fund. It would be simple for the Finance Committee to set up each year a small emergency fund to begin a program and then to allocate money as needed. It is true that there are emergencies both in biological control and in eradication, but, in our opinion, officials in the Department of Food and Agriculture are paranoid on the subject.

There are three courses of action when an invading pest comes to California; nothing may be

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done, and the pest finds its place among other in-
sects, the invader may be eradicated, or it may b
placed under biological control. Such choice i
governed by many factors, and should be made b
a person deeply versed in entomological scienc
For example, in 1948 when the Australian see
fly was found in lawns in Golden Gate Park i
San Francisco, no action was taken, because th
pest was considered of no economic importanc
When a new mealybug came to Monterey County
in 1952 and was found in tomato and bean fields
it was judged that population pressure had caused
it to seek these fields rather than the attractiveness
of the host. Again nothing was done. [1]

However, the usual choice is between eradi-
cation and biological control. Eradication require
complete destruction of all living specimens, and
biological control involves acceptance of new in-
sects. Eradication requires that no living insect
survive, but biological control attempts no such
purge. Insects divide into hunters–parasites and
predators–and the vegetable-eating insects called
pests, serving as food supply for hunters. The ex-
pert may judge that native predators, such as lady
beetles or lacewings, will control the new pest, or
entomologists may capture its natural enemies
and import them from its homeland. The true test
of the danger of an invader is not the number of
plants attacked, but the number and effectiveness
of its natural enemies and the experience of ento-
mologists in this matter. Furthermore, before
eradication is undertaken, there should be compe-
tent evaluation of the pest's power of survival and

ability to do injury in its new habitat.

Implicit in this decision is choice between
biological control of insect pests and a petroche-
mical agriculture. Nature has chosen the first alter-
native: for millions of years, far longer than man
has existed on this planet, insects, variously esti-
mated to number 625,000 to 900,000 species, have
fought for living space to achieve a dynamic adjust-
ment. [2] Sometimes that balance is disrupted, usu-
ally by weather, so that pesticides may be required
briefly and usually for only a single crop. These
occasional needs might have been satisfied by pesti-
cides that spread insect diseases, such as *Bacillus*
thuringiensis for caterpillars, [3] less toxic pesticides,
or various cultural methods. Instead, the decision
was made for the first time in the history of agri-
culture to manufacture pesticides from waste pro-
ducts of oil refineries, and to use these pesticides
to supersede all natural controls.

In making a wise decision between eradication
and biological control, the Division of Biological
Control of University of California is the most
competent of all groups in California, since it is
the repository of a vast fund of information about
the relationship of pest to natural enemy and is
part of a worldwide scientific network of entomo-
logists sharing this information. This tremendous
fund of knowledge will be vital to the survival of
the human race if the petrochemical agriculture
now prevelent should prove inadequate and dan-
gerous. It should be equally apparent that it coin-
cides with profits for pesticide manufacturers and
salesmen to obscure and belittle the achievements
of these scientists.

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CHAPTER II

HAWAIIAN SUGAR PLANTERS CHOOSE BIOLOGICAL CONTROL

Hawaiian sugar planters have chosen biological control for invading insects, and use no insecticide on sugarcane.

"Sometimes agents come all the way from the mainland to sell insecticide, and then find that we don't use it," said Dr. C. E. Pemberton, dean of sugarcane entomologists, when I interviewed him in the office of the Hawaiian Sugar Planters Experiment Station in 1956.

When I wrote for information to update conditions, I received the following letter from Dr. A. K.Ota, Head of the Entomology Department of the Experiment Station, dated May 1, 1975:

"At the present time, we continue to rely on biological control to suppress pest insects that attack the sugarcane plant. We do not apply any insecticides for controlling insects that directly attack the plant. However, there are certain situations under which we may use insecticides. In recent years some of our cultural practices have changed, or certain environmental laws and economic factors have caused insect problems in our fields. In the two cases I would like to mention,

the pest insects do not attack the plant but live and breed in the sugarcane fields.

"Certain ants attack polyethylene tubings used for drip irrigation of sugarcane. Drip irrigation is a new method of irrigating sugarcane which shows great promise under our field conditions. This system of irrigation will probably be our major method of irrigation in a few years and replace our standard furrow irrigation in most fields. We have explored the use of certain insecticides to control the ants. Unfortunately, ants do not seem to have any effective natural enemies except other ants.

"The second problem involves mosquitoes. Our sugarcane factories produce a lot of 'factory waste' water because of culture, harvesting techniques, and cane cleaning operations. A certain portion of this water was used for irrigating sugarcane (recycling), but a large amount was also discharged into the ocean until a few years ago. Water pollution laws have stopped us from discharging the water into the ocean. Thus all the water from our factories has to be recycled onto our fields. In addition, economic factors have resulted in the enlargement of many of our factories, and we now have more waste water being generated at some of our factories. At some plantations, unfortunately, the size of the fields designated for waste water irrigation is limited by natural terrain and other geological characteristics of the landscape, and additional pumps, reservoirs, pipeline, and ditches must be installed to handle the additional volume. In some cases, these projects have taken several

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years because of high costs, lack of equipment and parts, and technical difficulties. The waste water is high in silt, organic debris, mineral content, and microbial organisms. Ordinary equipment cannot withstand this heavy load and frequently breaks down.

"The result of all this is that we have an excess of waste water to recycle on the limited field acreage. Irrigation is excessive and in some fields the low-lying areas become swampy and water-logged. Mosquito breeding can become a problem in these water-logged areas. Pesticides to stop mosquito breeding must be used. We have cooperated closely with the State Department of Public Health on this problem. I am sure that the mosquito problem is only temporary, and proper engineering to handle the waste water will be done.

"The two problems discussed above have resulted from changes in our agricultural practices and from changes in our laws. Biological control is difficult to use on ants (I know of no successful case) and biological control of mosquitoes is difficult because mosquito-eating fish (used commonly in our clean water situations) cannot survive in the factory waste water."

These sugar planters are not sentimental nature worshippers; they are hard-headed business men, large landholders like the corporation farmers of California; yet they do not put insecticide upon the sugarcane. Why do they have such a different philosophy? How have they correlated limited use of insecticides with business profits? How would they meet invading pests? Can other farmers use

these methods?

The Hawaiian Sugar Planters Association in 1904 hired entomologists to find remedies for sugarcane leafhoppers; from this decision to use biological control, they have not deviated. [4] After this first success, their entomologists explored the world for other enemies of sugarcane pests; the search still continues in jungle lands and tropical islands.

Hawaii differs from other states in the United States in the group which dominates thinking in entomology. Since entomologists in Hawaii are employees of farmers, they consider the welfare of farmers, and find no conflict of interest in pursuit of science. Biological control correlates with the best scientific thinking and is best for farmers; therefore, these Hawaiian entomologists serve both science and farmers. They are a happy, relaxed group, proud of their work and confident that they are right. They also seem healthier than scientists on the mainland testing the most deadly insecticides to the detriment of their own bodies.

The relaxed attitude among entomologists for the sugar industry communicates itself to sugar planters. Entomologists rejoice that the warm climate throughout the year permits pests a plentiful food supply at all seasons, and sugar planters view pests with indifference, because they realize that pests serve as food supply for beneficial insects. They know that even a large population will recede under the eating habits of hunters; for example, a recent outbreak of taro leafhoppers was controlled by an efficient,egg-sucking

predator. These entomologists shrewdly read the signs that pests are yielding to their pursuers. Such methods of evaluation are the first lessons to be learned by one who would use biological control.

These Hawaiian entomologists belong to a world community of scientists, acquainted across the oceans and respectful of one another's work. Visitors at the insectary facilities in Honolulu during a typical year included entomologists from Cornell University, University of California, Australia, New Zealand, Ceylon, Japan, Thailand, New Guinea, Korea, and Taiwan. All share common knowledge to which they are proud to add perhaps the name and description of a pest, or details of its life that will prove an Achilles heel leading to control, or perhaps similar information about a beneficial insect. Entomologists also must learn thousands of life histories of insects–the fascinating pattern of life. By slow augmentation, entomologists have learned a small part of the ecology of the insect world, and have gained such respect for this web of life that they hesitate to disrupt it. Such is the nature of research of these entomologists for sugar planters.

They keep a rogue's gallery more complete than that of any police department; they must know all pests of sugarcane and all their natural enemies throughout the world, as well as their complete life histories. The native insects give little trouble, for one has adjusted to another, unless insecticide upsets the relationship. Invaders without natural enemies create a problem, and Hawaii, on crossroads of sea and air traffic, has had many

such pests from distant lands. Entomologists working abroad depend upon the vast storehouse of knowledge already compiled and upon assistance from foreign entomologists. The Commonwealth Institute of Biological Control, the oldest organization, has been followed by La Commission Internationale de Lutte Biologique for cooperative work in Western Europe. Similar organizations work in Eastern Europe, but Hawaiian entomologists have had to center in humid fields of tropical lands, whence come pests for sugar.

Dr. R.C.L.Perkins, first head of the sugar planters' staff, sent workers on odysseys of exploration. A minute egg parasite of leafhoppers was brought from Australia, another from the Fiji Islands, and still another from Ohio. When leafhopper parasites were shipped from Wei Chou, China, only a single female remained alive, but from this single insect numerous progeny developed. Leafhoppers have become minor, still present but unimportant.

Because of slow ships, many valuable shipments arrived dead. One entomologist, attempting to bring a tachinid fly to Hawaii, worked on the project from 1908 to 1910 and finally established a relay breeding station before he could bring in living insects. Airplanes have solved the problem of time for entomologists, but have aided invaders moving across oceans.

In importing new insects, scientists must consider changed feeding habits; for example, insects controlling noxious weeds must starve before they attack valuable plants. The mongoose may be

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found in rural Molakai; brought to Hawaii to control rats, it developed a taste for chickens. Since Hawaii has no snakes, it could not pursue reptiles, as indicated by Kipling's eulogy of the mongoose. Hawaii has had many successful immigrants: the mynah bird may be seen everywhere in Honolulu; it was brought to Hawaii to eat armyworms. Parasites of grubs of the anomala beetle were brought to Hawaii, and Dr. Pemberton, himself, imported a toad from Puerto Rico. A sugarcane beetle borer was conquered by growing a hard type of cane and importation of natural enemies. Years ago the blackwidow spider arrived from the mainland without its natural enemies, whereupon entomologists sent to California for insects for its control. Southern green stink bugs recently have arrived but are now being destroyed by an insect from Australia. Twenty-seven kinds of beneficial insects were liberated, and thirty-two were introduced but not freed until their habits could be checked.

Pests which cause screaming hysteria on the mainland generate no alarm in Hawaii. The insidious armyworm, secreting itself under debris during the day and feeding with cutworm vigor during the night, destroys entire fields before being apprehended. Somehow valuable information about armyworms collected by the United States Department of Agriculture at Brownsville, Texas, and elsewhere has been obscured in the general devotion to pesticides on the mainland of the United States. Hawaiian scientists brought predatory insects from California and six types of parasites from Brownsville.

Hawaiian entomologists have the services of a small, active larrid wasp, parasitizing crickets. Not even mole crickets, burrowing into irrigation canal banks, disturb Hawaiians; wasp parasites from the Philippines solve the problem. The grasshopper is controlled by a new species of egg parasite from Singapore. Horn flies are checked by a large Scarabaeid beetle from Mexico, which breeds in manure and scatters it, so that flies cannot breed.

Aphids are the common enemy of farmers. They attack almost every type of vegetable and fruit; some suck sap and cause blighting of buds; others dimpling of fruit, curling of leaves, and discolored spots on foliage. Pesticides do not control aphids well, because aphids conquer by extraordinary power of reproduction. Hawaiian entomologists have imported several lady beetles and a brown lacewing from Queensland, Australia, and aphid parasites from Whittier, California.

Sugarcane mealybugs are controlled by parasites, and these parasites were recently sent to Louisiana. Hawaiian entomologists also procured parasites for avocado mealybugs.

Farmers who have been told to fumigate soil will be interested that Hawaiian farmers asked their entomologists to investigate growth failure in sugarcane and these scientists studied the microscopic life in the soil and concluded that nematodes were not the problem.

For snails, a carnivorous snail, feeding on other snails, was introduced, as well as several snail--consuming marsh flies.

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There is no blind trust in nature, for that is the view of a gardener with an untended garden. Modern entomologists at their best take maximum advantage of the complexity of plant, animal, and insect life; they respect the relationship of one thing to another, the ecology of the living world, but they attempt to limit undesirable species of plants, animals, or insects without injury to the valuable species or the total pattern. They operate within laws of nature, but manipulate nature delicately by tipping it to mankind's advantage.

In addition to the staff of the Hawaiian Sugar Planters Experiment Station, the State Department of Agriculture has one man designated as an exploratory entomologist, whose job is to find and introduce natural enemies. He is assisted by about fifteen men who rear, release, and establish new beneficial insects.

Why should Hawaii adopt so sane a policy and California lead the United States in use of pesticides? We submit this thought: the political climate makes the difference. In Hawaii the landholders dominate, so that entomologists follow practices beneficial to farmers. In California oil companies are mighty; therefore, a petrochemical agriculture is promoted. Lay this measure against the facts and make your own judgment.

CHAPTER III

UNIVERSITY OF CALIFORNIA SHOULD DECIDE

Sometimes Eradication Is Wise

Eradication of invading pests, however, may be chosen. One good eradication program in San Diego County centers on the Mexican fruit fly, which is brought regularly into this area by fruit hauled from central Mexico to Tijuana, Mexico, whence the fly crosses the border. Traps are set for fruit flies, and sterile males are released whenever it is deemed advisable. This program uses a technique developed by the United States Department of Agriculture whereby insects are irradiated to just the degree to make them sterile but active; by mating they cause race suicide. [5] There is no hazard of poison to the public and the program continues with few people aware of it. It requires a small population of the target pest; therefore, it failed completely against pink bollworms and will fail probably against all pests widely distributed in a continental area, but against invading pests with a small population it seems ideal.

Eradication is seldom successful with pesticides unless the pest population is minor and centered in a small area, and the life history of the pest

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of such character that at some point in development it can be reached by pesticide. A successful program centered on the Khapra beetle, a pest of stored grain, because storage warehouses could be fumigated. A conspicuous failure was the attempted eradication of the pink bollworm, because the pest was widely distributed and at no point could be reached by pesticides. This hardy pest proved invulnerable to both the sterile insect technique and pesticides. Furthermore, it was unwise to attempt to eradicate pink bollworms, because they were established in Arizona, and their arrival in California was inevitable. There is also a point in every eradication program when entomologists should evaluate it for results, and perhaps change to biological control of the pest; for example, eradication should not be continued if the pest has spread widely. Thus no rule can be devised, but each decision must be made by experts.

The Division of Biological Control Should Decide

The Division of Biological Control of University of California is more able to make a competent decision than the Department of Food and Agriculture, since its scientists have had more experience in entomological science than the other group, entrusted with numerous administrative duties.

The Million–Dollar Emergency Funding Has Resulted In Abuses

Independent use of the million–dollar annual emergency fund has resulted in abuse of power in a department already possessing dictatorial powers and to bureaucratic excesses detrimental to agriculture and to the welfare and health of citizens in the areas affected by the eradication projects. For factual support of these opinions, People's Lobby presents a review of current programs in the Department of Food and Agriculture.

CHAPTER IV

WHITEFLIES CROSS NATIONAL BORDERS

The odd part of the whitefly program in San Diego and adjacent cities was that an eradication project and a biological control project were conducted simultaneously in the same area, so that they collided. The following outline of events indicates that eradication with pesticides and biological control do not mix.

The woolly whitefly and the citrus whitefly, both citrus pests, came to San Diego in 1966, and in the fiscal year 1966–1967 Dr. Paul DeBach, a

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world famous entomologist from University of California at Riverside, was hired by the Department of Food and Agriculture to import natural enemies of these whiteflies. He brought three parasite species from Mexico. Although it is generally known, even by those unversed in entomology, that delicate beneficial insects cannot survive poison, the Department spent $341,196 in that year to spray citrus in yards in San Diego and adjacent cities where Dr. DeBach was attempting to colonize his insects.

In the next fiscal year (1967–1968),Dr.DeBach reported that only one species, *(Amitus)* had been established, and that the other two species had been imported again from Mexico because those released the previous year had been killed by spraying. In spite of this problem, $191,000 was spent for insecticide. 6

The next fiscal year (1968–1969) gave promise of success, and Dr. DeBach exults: "The potential for biological control of the woolly whitefly appears quite promising. Two species are established, and one, *Amitus,* has demonstrated the capacity to reduce and maintain host populations at low levels. Observations in Mexico, the Carribbean, and elsewhere indicate that parasites usually maintain satisfactory biological control of the woolly whitefly."6,7

The biological control plan was succeeding; therefore, the time had come to stop the eradication program. Instead, hysteria developed among sprayers. Plainly, officials of the Department, although they had employed Dr. DeBach, did not

understand his work and had no intention of consulting him. Again they spent $211,732 for insecticide and its application in the areas where Dr. DeBach hoped to establish his precious parasites. A media campaign announced a four–year spraying program against whiteflies, and citrus growers were frightened into donating $68,000. Daily bulletins were printed regarding the war against whiteflies, and the entire community was alerted to the imaginary danger of whiteflies out of control.

Meanwhile, a danger far more real was developing: while success seemed at hand for control of woolly whiteflies, Dr. DeBach was experiencing difficulty in rearing the natural enemies of the citrus whitefly. Citrus whiteflies presented technical problems, because their natural enemies had to be secured from India and West Pakistan, and laboratory rearing proved difficult. "*Prospaltella* species have hyperparasitic males which must develop on other parasite larvae and pupae, and this makes initial field culture and field establishment very difficult," Dr. DeBach explains. "Arrangements were made with the Commonwealth Institute of Biological Control in West Pakistan and India to continue collections and shipments. From September 28, 1968 to January 21, 1969 we have received 9 shipments from West Pakistan. They yielded a total of 470 *Prospaltella ? Lahorensis* (190 females) which have been used to try and establish insectary cultures. The first evidence of successful culture was obtained in the last two weeks. Parasitized whitefly nymphs were observed in our

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insectary culture, but it is not yet known if the necessary chronological succession of males and females had been obtained." [7]

The men of the Department of Food and Agriculture should have been distressed, but seemingly they thought of nothing but their war against woolly whiteflies, as their activities were described in the newspapers. That this was preventing field colonization of these precious parasites, obtained so far away and reared with such difficulty, did not trouble them. This harassment of scientists working with biological control during this period jeopardized the successful introduction of natural enemies of whitflies, and it demonstrated beyond question the lack of sympathy and understanding of biological control by officials of the Department; yet there was no alternative to biological control, because this eradication was doomed to failure from the beginning.

At the very time when Dr. DeBach was struggling with this technical problem, entomologists in the Department admitted that they had failed to eradicate the citrus whitefly. [8] This is a serious pest if it is not controlled by natural enemies, but officials seemed to have lost interest in the subject when they discovered that it did not yield to eradication. Like hounds chasing a false lead, they were in pursuit of the woolly whitefly.

Dr. DeBach had been assigned small plots for his beneficial insects, but these could not be maintained if a massive four-year eradication of woolly whiteflies was carried out. Therefore, these beneficial insects were moved into the Tijuana area in

division, where whiteflies existed. The Mexican entomologists refused to spray and protected the imported insects; otherwise the entire experiment would have failed. All field colonization of parasites ended, and all efforts were directed toward keeping them alive during this irrational period. [9]

People who lived in the sprayed areas were becoming indignant at the mandatory use of pesticides on their premises, and many were feeling ill. Therefore, they asked me to write to the Director of Food and Agriculture to ask for an end of the spraying. My letter of November 12, 1969 to Jerry Fielder contains these sentences: "All colonization of natural enemies of the woolly whitefly north of the border has been halted, and probably those already released are dead. This nullifies two years of expert work by this world famous entomologist (Dr. DeBach), and exposes the citrus industry to the depredations of pests uncontrolled by natural enemies. You have already failed to eradicate the citrus whitefly; the attack on the woolly whitefly will be equally futile. The latter pest is a Mexican insect firmly established south of the border in the Tijuana area. Do you plan to post border guards to warn woolly whiteflies not to cross into the United States?" [10]

I received a routine denial of the request of San Diego people to stop the spraying from William F. Cowan, writing for Jerry Fielder, and in the following fiscal year (1969–1970), 11 people who resisted the spraying crews were taken to court, and court orders were issued on plea of emergency. Some people chopped down their

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trees in order to prevent spray rigs from enter
their property. Twenty spray rigs applied diazin
to 528 city blocks in San Diego, Lemon Grov
Encanto, National City, Chula Vista, Bonita, a
Spring Valley, and finally the area was extended
850 city blocks. $549,508 was spent during th
fiscal year. It was demonstrated thus that burea
crats with an appropriation are as difficult to sto
as a steamroller, and quite as obdurate.

That these boondogglers from the Departme
knew of the existence of the woolly whitefl
south of the border even as they planned the
massive program is indicated by this sentence i
the Governor's budget of 1969–1970: "Recen
discovery of established infestation of woolly
whitefly at Ensenada and Tijuana, B.C., Mexico
necessitates evaluative work at these locations
Observations and evaluations in Mexico will b
done by the United States Department of Agri
culture representatives in the area."

Throughout the entire enterprise, everyone
knew that these were Mexican insects. Dr. DeBach
went directly to Mexico when he first began his
work. If the chief entomologist of the Depart-
ment of Food and Agriculture were honest and
competent, he must have known that he was
dealing with a Mexican pest. How could he avoid
this knowledge?

The whitefly eradication program should never
have begun, because the pests were widespread and
well established in 1966. Also, much was known
about natural enemies of whiteflies. These circum-
stances should have motivated biological control.

On February 26, 1971, the decision was made
change from eradication to biological control
woolly whiteflies, and Dr. DeBach was asked to
his beneficial insects back from Mexico and
colonize them once again in San Diego. [12,13]
In spite of all obstacles presented by the Depart-
ment of Food and Agriculture, both types of
whiteflies were brought under control of natural
enemies in 1972; therefore, it would seem that
this disgraceful and absurd episode of boondogg-
ling should have ended. San Diego people believe
firmly that no scientific principle governed this
program, but that it was motivated solely by the
imminent availability of the million-dollar appro-
priation. Seemingly a new principle has entered
entomology: if an appropriation is available, spend
it and seek more. The massive spraying was con-
ceived during the period that legislation for musical
chairs funding was making its way through the leg-
islature; no doubt the atmosphere in Sacramento
was clouded by fear of insects, and all rational
entomological science was submerged.

Although biological control of woolly white-
flies and citrus whiteflies succeeded in the fiscal
year 1972–1973, there was no public announce-
ment of this tremendously important informa-
tion. [14] Instead, the San Diego County Agricul-
tural Commissioner attempted to raise $700,000
to eradicate whiteflies spreading to the northern
part of the county. [15] If pest and natural enemy
spread together, no serious damage to plants res-
ults, because a balance in population is obtained.
However, if a new infestation is sprayed, the

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delicate wasp parasites always suffer more th
pests, so that pest population increases. Th
already had been demonstrated in San Dieg
where parasites had been killed and pests ha
survived. Now the lesson was to be repeated wit
citrus growers paying for eradication, not of whit
flies but of their natural enemies. This has all th
honesty of a confidence game, including suppre
sion of vital information.

In the 1973–1974 fiscal year, the same foll
was repeated by spraying out natural enemies o
whiteflies in the San Diego area during the Jap
anese beetle eradication program. As benefici
insects disappeared, people observed an increas
of pests of all types, including both types of whit
flies. When they questioned the County Depart
ment of Agriculture, they were told to let nature
have its way, so that parasites would return, but
irrational spraying continued in the north part of
the county.

Officials in the Department of Food and Agri
culture became more arrogant: since they legally
have charge of all types of pest management,
including eradication and biological control, they
took entire charge of Dr. DeBach's biological con
trol program, including distribution of the bene
ficial insects. When I visited Dr. DeBach at Univer
sity of California at Riverside, I found him worry
ing, because he had been separated from his own
program.

After a damaging spraying had been completed
at Carlsbad and in other parts of the north county,
a meeting of the various agencies working on the

whitefly program was held in the fiscal year 1974–1975, and the California Department of Food and Agriculture ordered Dr. DeBach to have charge of biological control, and spraying was stopped in north county.

But officials in the Department of Food and Agriculture are unrepentant. When I talked to Dan Robinson, Acting Chief of the Bureau of Entomology, who had a large part in planning the whitefly program, he told me that biological control programs seldom succeed. Of course, they do not with the pesticide squad pouring poison upon them.

In these matters there is a tendency for state departments of agriculture to imitate the United States Department of Agriculture. For example, the fire ant eradication program was a massive boondoggle at the federal level, which continued for thirteen years. During the first part of the program, dieldrin was sprayed by air to kill ants under the ground, a manifest absurdity. This killed everything, including wildlife and cattle, but not ants. During the latter part of the program, mirex was placed in a food attractive to ants, but the fire ant survived and extended its habitat. Finally, EPA made restrictive regulations for use of mirex, thus bringing down upon itself the wrath of Jamie Whitten, Congressional czar of agricultural appropriations and servant of pesticide interests.[15]

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What did this whitefly eradication cost the State of California?

ESTIMATES OF SAN DIEGO WHITEFLY EXPENDITURES

By the Department of Food and Agriculture

	Eradication	Biological Control
1966--1967	$ 341,162	
1967--1968	191,000	
1968--1969	211,732	$ 41,000
1969--1970	349,508	25,000
1970--1971	65,000	100,000
TOTAL	$1,358,402	$ 166,000

These figures were furnished by Dan Robinson, who adds the following explanation perhaps of interest to the Finance Committees:

"The whitefly data include action against the citrus and woolly whiteflies because these were handled as one, both fiscally and in the field. Close to 15% ($196,000) of the eradication total was citrus industry support to the program. Another approximate 10% was spent in a bionomics study to determine program feasibilities. About two-thirds of the remaining 75% was spent on surveys to maintain up-to-date information on status of spread of the pests. The biological control funding includes $100,000 for direct work of Department personnel as well as for work that the University

of California performed for the Department under contract. The rest of the bio-control activities were funded by the citrus industry." [16]

One should note the tremendous sum spent for eradication and the small amount allowed for biological control. The successful method, which permits farmers to stop spraying and incur no further expense, cost the state almost nothing in comparison to the vast, awkward boondoggle. However, the $100,000 for biological control is in question, since it would be difficult to know whether it was all spent wisely without knowing what members of the Department did with their part of this money. The comparative costs, however, of the two methods of pest management should interest Finance Committees of the Legislature.

Gregory Beals, Budget Officer of the Department of Food and Agriculture, has slightly different figures for the woolly whitefly: [17]

	Woolly Whitefly
1968–1969	$ 152,733
1969–1970	460,367
1970–1971	187,770
1971–1972	69,251
1972–1973	61,216
1973–1974	199,077

The average citizen may find these differences disconcerting, but I assume that they result from the inclusion or the omission of industry contributions.

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HOW DOES ONE DEAL WITH A SPREADING INFESTATION?

What would be a reasonable plan for dealing with whiteflies in the future? Again we find the Division of Biological Control and the Department of Food and Agriculture holding different opinions. State officials practice what they call containment of pests, which is the euphoneous designation for the north county spraying; that is, they spray on the outer fringes of the infestation. Ned Shireman of Vista, California, first alerted us to this in 1974 by an indignant telephone call, stating that his citrus grove had been sprayed without notice or permission on his part. The excuse was that there was an infestation of woolly whiteflies, then widespread in the south part of the county. This underlines the threat of such emergency power to organic farmers or to any grower who wishes to govern his own spray program. Under plea of emergency, these state sprayers may invoke the police power of the state and work their will on any home or farm. Containment, then, may be used to sweep away the beneficial insects that mean success to organic farmers, if such is the caprice or error of officials.

The Division of Biological Control has its own plan for dealing with future problems with whiteflies. Their spread through citrus areas of California is inevitable, but it is not a disaster. They are under control in San Diego: pest and natural enemy seek a balance, and man does not need to interfere. However, the parasites now doing so well

in San Diego may not thrive in hot areas. There should be no effort to prevent their spread, but other parasites suited to different climates should be sought. A program is not complete until it has been demonstrated that there are proper natural enemies for every climate.

Fortunately the Division of Biological Control can draw upon the experiences of entomologists throughout the world. In 1910 the citrus whitefly was causing a 45–50 per cent loss in Florida citrus, and was a serious pest in the gulf states from Florida to Texas. Dr.L.O.Howard of the United States Department of Agriculture, assigned Russell S. Woglum to seek natural enemies. Since these whiteflies had come originally from the Orient, he went to India and found the pests in Lahore in the Punjab. However, they were under control by a new parasite, which he named *Prospaltella Laborensis* Howard. During the period of ship transit, entomologists had great difficulty bringing insects great distances: only eight parasites arrived safely. Unfortunately they were winter–dormant, or in the diapause, and did not survive. This adjustment of insects shipped from across the equator and experiencing change of seasons is a serious problem. However, this early experience pointed Dr. DeBach to the Orient in 1967. This time he shipped *Prospaltella Laborensis* by airmail. The predator *Cryptonatha Flavescens* Motsch., a tiny lady beetle found feeding on eggs and larvae of whiteflies, Dr. DeBach has named as the next import. [18]

The citrus blackfly, a member of the whitefly family, derives its name from the shiny black color

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of the nymphs and pupae. It was found in Jamaica in 1913 and in Cuba in 1916, whence it spread to other islands and to Panama. Because Cuba is close to Florida, there was danger of its introduction into Florida citrus; therefore, the United States Department of Agriculture entered into agreement with the Cuban Department of Agriculture, Commerce, and Labor to join in a cooperative effort. By 1930 the problem had become acute.

A review of this program gives one insight into how the worldwide network of entomologists operates. Professor Filipo Silvestri of Portici, Italy, had done his work in foreign exploration for University of California at Riverside in 1924–25, and the information he gained on this trip resulted in complete control of the related spiny blackfly in Japan. The original stimulus for the United States–Cuban project developed from the reading of Silvestri's papers by Professor J. F. Tristan of San Jose, Costa Rica, where the blackfly was also a pest. He began a correspondence in 1927 that motivated the program. It was this information which inspired Dr.C.P.Clausen, then of the United States Department of Agriculture and later of University of California at Riverside, to discover and import natural enemies of this pest from the Orient.

Dr. Clausen went twice to tropical Asia, where he studied in the Philippines, Thailand, Malaysia, Java, Sumatra, Burma, and Ceylon, but finally decided upon Singapore. He found five species of parasites and nine of predators attacking the citrus blackfly. The best he decided were *Eretmocerus*

which soon became established. They increased rapidly so that by 1932–3 biological control in Cuba was complete. The total cost of the project, as estimated by Dr. DeBach, was $10,000; this included payment for travel and research in the Orient, collection and shipment of material, establishment and distribution of natural enemies in Cuba and other countries. Entomologists in neighboring islands spread parasites in the Caribbean and presently to Mexico.

In all of the hot humid islands, the parasite was successful, but it was a failure on the west coast of Mexico, especially in desert areas. The citrus blackfly had been found in El Dorado, Sinoloa, in 1935, and had spread to become one of the most serious pests with 80 per cent crop reduction in the early 1950's. A cooperative project between the Departments of Agriculture of the United States and Mexico was arranged, and Dr. Herbert Smith of the United States Department of Agriculture went to Malaysia to obtain parasites that Dr. Clausen previously had observed. He secured three parasites–*Amitus hesperidum* Silvestri, *Prospaltella opulenta* Silvestri, and *Prospaltella clypealis* Silvestri. *Amitus hesperidum* was the best of the three, but did not do well in hot weather, so that *Prospaltella opulenta,* more successful in hot desert regions, replaced it in states such as Sonora. *Prospaltella clypaelis* controlled the pest in humid climates. Thus, working together, each one in the climate of its choice, these three paraistes controlled blackflies in all of Mexico.

This is the problem that entomologists must

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explain to the legislature. When biolotical cont
has succeeded in one area, the problem is not f
ished. Control of whiteflies may be successful
the climate of San Diego, but an entirely differe
parasite may be required in the warm dry clima
of Riverside. Movement of whiteflies and the
natural enemies must be monitored in every
mate zone in California by experts from the Di
sion of Biological Control. Entomologists
Mexico have had the experience that several diffe
ent parasites are necessary, and Americans shoul
learn from them. Only a person without knowledg
of these matters would consider a problem in bi
logical control solved because a parasite has bee
successful in a single area.

HOW CAN BIOLOGICAL CONTROL BE PRACTICED IN SPRAYED GROVES?

There is another problem which concerns the behavior of men: the citrus grower follows the practices of a petrochemical agriculture, and para thion or Sevin will kill the delicate parasites; yet whiteflies are pests difficult to control by pesti cides. Inexorably whiteflies will move into the groves, and if they are not accompanied by their natural enemies, they will give trouble. The intelli gent citrus grower should look with doubt and sus picion at his own pesticide practices, for this is a problem not to be solved by another pesticide.

The experience of the Fillmore Citrus Protec tive District of Ventura, California, offers a meth od whereby pest and natural enemy may together

welcomed. This is a unique cooperative pest control association, comprising some 8800 acres, growing policies developed by Howard Lorbeer, now retired, and entirely committed to integrated pest control. Dr. DeBach states that he has cooperated with Mr. Lorbeer frequently. The district maintains its own insectary, and uses a minimum quantity of pesticides least toxic to beneficial insects. Broad spectrum pesticides, especially parathion, malathion, and Sevin are not used, and spot spraying is practiced; groves are carefully observed, and a small area where a problem first appears will be treated rather than the entire acreage. Thus beneficial insects are protected.

Ten insects that are serious pests in other parts of the state are completely controlled here by their natural enemies, according to Dr. DeBach. These include the black scale, California red scale, yellow scale, brown soft scale, dictyospermum scale, cottony–cushion scale, and four species of mealybugs. Dr. DeBach lists four of these as once major pests, but now either minor or completely innocuous. Those pests partially controlled by native natural enemies are the citrus red mite,citrus aphid, and orangeworm: that is, they sometimes give trouble but are not checked by massive spraying of an entire grove, perhaps only a few trees sprayed with an insecticide carefully chosen or the release of additional natural enemies from the insectary to augment those already present. [19]

Changing to biological control from use of broad spectrum pesticides, especially in groves heavily saturated in former years with DDT and

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other chlorinated hydrocarbons is difficult, like a person quitting narcotics. It must be done in spring, when life renews itself, not in summer after all beneficial insects are slain. The road out is by way of an integrated spray program, and in this growers need advice from the Division of Biological Control. The Department of Food and Agriculture should contract immediately with the Division of Biological Control to devise plans for an integrated spray program for citrus, culminating in biological control.

Instead, the Department advocates legislation to tax the citrus industry to spray new infestations of whiteflies; the word used by officials is *control* or *containment,* but the Department means eradication in each new area of infestation as whiteflies spread, an eternal spraying program such as that practiced on the grapeleaf skeletonizer, discussed in the next chapter. This is a means of legalizing a petrochemical agriculture, and of prolonging it into the indefinite future. It could benefit only the pesticide manufacturers and salesmen who bitterly oppose any reduction in use of pesticides. One wonders what lobbyists have taught these officials their entomology that they should so violate all principles of science.

CHAPTER V

A BOONDOGGLE LASTING FOREVER

The proposal of the Department of Food and Agriculture that legislation be enacted for grape growers to tax themselves $480,000 annually to pay for eradication of grapeleaf skeletonizers seems more like a con game than honest science. 20

When a pest has been established for a number of years and has spread widely, it cannot be eradicated. The grapeleaf skeletonizer was found in San Diego County near Alpine in 1942, and before eradication began in 1947 had spread throughout San Diego County. Although there was heavy spraying with cryolite, and wild grapes in the canyons were destroyed, eradication was abandoned as a failure in 1950.

Biological control of the pest was successful in 1956 because of importation into San Diego County of the parasite *Sturmia harrisinas* Coquillett and a virus disease by Dr.O.J.Smith of University of California at Riverside. In searching for natural enemies, he introduced twenty–two species of parasites, a wasp, and a tachinid fly. The grapeleaf skeletonizer, then, disappeared as a budget item.

Discovery of a method to bring the grape leafhopper under biological control removed the last obstacle to producing grapes without use of highly

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toxic pesticides. Dr.R.L.Doutt and Dr. J. Nakata of University of California at Berkeley found that an important parasite of the leafhopper died out in some vineyards in winter but survived in others. The mystery was solved when they discovered that this valuable parasite was able to live by parasitizing eggs of another leafhopper on blackberry vines. Grape growers merely had to make sure that blackberry vines were planted near vineyards in order to provide a winter host for the necessary parasite. 21

Conquest of the major pests on any crop, so that it no longer needs to be sprayed with highly toxic poisons should call for rejoicing, especially if the crop is a food such as grapes enjoyed by consumers throughout the world. All grape growers should have been told that they need spray no longer, and informed how to protect their vineyards. Furthermore failure of chemical eradication in San Diego County had proved that this approach to the pest was impossible. It has been noted that grapeleaf skeletonizer disappeared as a budget item for eradication after 1956. It was spreading over California and causing no trouble, because pest and natural enemies moved together.

Apparently later the plan of spraying each new infestation began to gain support, for officials claim that the skeletonizer was eradicated at Kerman (1961–1966), Livermore (1962–1968), city of Fresno (1964–1970), and Davis, Sacramento, Roseville, Placerville (1966–1967–1973). Current eradication continues in Siskiyou, Fresno, Santa Clara, and Orange Counties.

"The Siskiyou infestation is confined to wild grapes scattered over approximately 45 square miles of rugged mountainside along the Shasta and Klamath River," states the Department summary. "The rivers themselves, the precipitous terrain, the intermixing of grape vines with blackberry and poison oak, and those vines that grow 20–30 feet into the tree canopy all pose real problems with regards to our efforts in eradicating this insect. In 1973 live skeletonizer finds were made around the confluence of the Shasta and Klamath Rivers, and a new find was made along the Klamath one–half mile north of the Collier Park Rest Area. All indications are that eradication efforts can be brought back on schedule with eradication being accomplished by 1979." 22

Eradication failed in San Diego County in 1950 because the pest had spread over the entire county. What folly, then, persuades the Department of Food and Agriculture that a pest that has spread from the extreme south of the state to the most northern county can be eradicated?

The Department of Food and Agriculture bases its desire to make eradication permanent by legislation upon a reported outbreak of skeletonizers in San Diego County. Such release from control may come to a pest in two ways: unfavorable weather may delay the usual increase of beneficial insects, or pesticide treatment may destroy them. If the problem persists, it should be studied by the Division of Biological Control rather than used as political propaganda upon which to base a statewide eradication program.

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The grapeleaf skeletonizer does not appear as a budget item until 1971–1972 when $124,661 was spent for eradication. Evidently programs in the 1960's were not extensive, but in 1972–1973 the Department of Food and Agriculture spent $169,859, and in 1973–1974 the amount was increased to $360,825, a total of $655,345. It is difficult to find any explanation for these expenditures except the million-dollar emergency funding and the need to find emergencies to support a growing bureaucracy. One observes, too, that the amounts seem to be increasing each year, and without doubt the cries of alarm grow louder at budget time. A fraudulent argument advanced regularly by the Department of Food and Agriculture is to measure possible insect damage by the number of plants attacked in an area without natural enemies rather than the degree of biological control. In an effort to fasten this everlasting boondoggle upon a suspicious industry, very probably the department has been guilty of this fallacy. In the June 1975 issue of *Ag Alert*, these bureaucrats are quoted as advocating a spray program in the backyard gardens of city dwellers, in order to keep the grapeleaf skeletonizer from spreading to vineyards. This is a strange statement, since it indicates that the pest, already established in an area, will not be generally distributed. It indicates the curious entomology that bureaucrats learn if their tutors are exclusively from the pesticide trade, and is symptomatic of a bureaucracy desperate to expand the department by needless eradication programs.

CHAPTER VI

THE BEETLE CAPER IN SAN DIEGO

Traps for Japanese beetles are scattered in Balboa Park in July 1975, foretelling another summer of eradication. San Diego is a quiet city of organic, backyard gardeners, a haven of the elderly and ill, who come to enjoy its healthful climate; yet one dead Japanese beetle in Mrs. John Rosenberger's pocketbook in 1973 triggered a spraying by air and ground machine that has lasted two summers and now extends into 1975. At the height of the tourist season, the soil of Balboa Park and adjacent residential areas was saturated with chlordane, and plants and trees in all the area were sprayed every two weeks with Sevin, later mixed with kelthane. In 1973 a helicopter spraying pesticide swept through Florida Canyon, a small valley running through Balboa Park in the center of the city and having a military hospital at one end and a junior high school on the other. Because a stiff breeze was blowing, the pilot quit before the job was completed, but pesticide drifted widely over the city. It was one of the oddities of the affair that Bob Wilson, San Diego congressman, would receive a letter from D.R.Fehlman of Control and Eradication, Division of Plant Industry, Department of Food and Agriculture, dated September 23, 1973, stating that " the treated area was

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not inhabited." [23] This obtuseness was motivated by the fact that aerial apraying of pesticides over an inhabited area such as a city is illegal, and it illustrated the official tendency to blank out facts not harmonious with their programs.

PESTICIDES ARE POISONOUS, ESPECIALLY TO THE ELDERLY AND ILL

City councilmen of San Diego at their next meeting were amazed at the crowd of people who came to protest and to ask for help. They came with hacking coughs and complaints of illness. These are some of the cases of those who appealed to the committee to stop the spraying:

Nadine Kirkendall, San Diego

Infected eyes, broke out in rash all over her body, itchy, and cough. She encountered a spray machine in operation on the corner of University Avenue and Park Boulevard and was sprayed. The target was some ornamental palms in the bank parking lot.

Carol Blackman, San Diego

Seriously ill. Suffers from cancer, petrochemical sensitivity. Had to leave Chicago and Tuscon, Arizona, on doctor's orders on account of extreme reactions to pollution and pesticides. Long history, can document problems. Suffered extremely severe reaction to the spraying by helicopter over Florida

Canyon on Sunday, August 26, 1973: burning eyes, edema, difficulty to urinate, drowsy, swelling caused unbearable pain in sciatica nerve, had to call pharmacy for pain reliever. She is still unable to get out of bed, is terribly scared of the planned helicopter spraying this coming Sunday and all future proposed applications in this manner, and really feels that her life is in danger.

Mrs. B. Lilledahl, San Diego

Seriously ill. Highly allergic to pesticides. Right after pesticide application by helicopter Sunday, August 26, 1973, she experienced extreme swelling of the nasal membranes, bleeding nose, eye irritation, severe headache. All these symtoms are still present and have kept Mrs. Lilledahl bedridden ever since. A renewed exposure to chemicals could further deteriorate her health. Feels also desperately frightened of a possible repetition this coming Sunday.

Lenore Vauter, San Diego

Swollen nose membranes, sore throat, cough, pain in her lungs, seems to get deeper in her chest, broken blood vessels in her eyes.

Ellen Heini, San Diego

Cough and sinus congestion.

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— Anne Wilde, San Diego

Cough, sore throat, difficulty breathing, bronchial irritation while breathing and eye irritation. Never had a cough before in her life. Went to the park on Sunday, September 2, 1973 and Tuesday, September 4, 1973, and her condition worsened each time.

— Edith A. MacLachlan, San Diego

Bronchial irritation and cough. Went to the edge of Florida Canyon to watch the spraying. Symptoms subsided this week, but flared up after going to Park Boulevard this afternoon, September 5,1973. Most people seem to have almost identical symptoms, and speaking from my own experience, I can testify that this particular cough and throat condition is not like any I ever had before. It is very special, as confirmed by everyone I have talked to.

"These facts were given to me," Edith MacLachlan has written, "and the names and addresses were telephoned to the Bill Gordon Show, KSDO Radio, San Diego. Many others may be listed, and complaints are still coming in. It is disturbing and sad to see the morbid fear in almost all of the people in anticipation of same to happen to them next Sunday."

A committee of citizens was formed to stop the aerial spraying, to investigate the validity of the infestation, to protect the health of citizens, and

finally as extraordinary facts emerged, to stop the entire eradication program for Japanese beetles. All were members of People's Lobby–Laura Lillian, Edith MacLachlan, Virginia Taylor, Ronnie Santalo, and Melvin Shapiro. Virginia Taylor and Edith MacLachlan also represented the Informed Citizens Union.

A shocked city woke to the fact that the Department of Food and Agriculture felt itself clothed with dictatorial authority, had no interest in any aspect of the spraying except destruction of beetles, and refused standing to any victim. However, when a group of women indicated that they planned to camp in Florida Canyon the next Sunday morning and await the spray plane, authorities yielded and contented themselves with spraying plants and trees. This was only a minor concession, for spray applied by a ground rig to trees will drift widely, and if spraying is frequently repeated, the entire area will develop and retain the atmospheric pollution of a sprayed field. Thus the people of San Diego were required to do what farm workers avoid; they were forced to live day by day under repeated spraying or desert their homes. Spraying centered in North Park, a residential area which was home to many living on social security, who did not have income to seek a second home.

The Beetle Bulletin, issued at the beginning of the program each summer by the Department of Food and Agriculture, persisted even as late as May 1, 1974 to justify the program rather than honestly to warn residents. It contained this astonishing passage:

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"Q. What about the spray, Sevin? Is it a healt hazard?

A. No. Not even if you should swallow a little of the more concentrated form by accident – and we are using a diluted form here. Volunteers demonstrated this during a five–day test in the Midwest when they ingested Sevin in moderate amounts with no ill effects." 24

When we challenged this purported test and asked for details, we never received further information. The poison drinkers remained incognito and elusive.

"Both chlordane and Sevin are extremely safe as applied. These chemicals are approved for use in restaurants and other food establishments for pest control," the official advice continued. Unfortunately this was true at that time, but EPA has now reversed its opinion.

There is much difference of opinion even among scientists regarding danger of pesticides: those centering upon short range effects (LD_{50} or lethal dose killing 50 per cent of test animals, usually rats) look at certain facts; those measuring long range dangers, such as production of cancer or birth deformity, view entirely different facts. Some chemists check only the original materials and maintain that they are gone when they are only transformed by chemical change. Others, unwilling to recognize problems, take advantage of the fact that the amount of pesticide and the number of test animals may be manipulated either to reveal

to mask adverse effects at the will of the scientist. Another variable factor is the increased sensitivity of the very young and the very old, as well as the strong possibility that data obtained by testing rats cannot be applied to mankind.

For these reasons, when the Department of Food and Agriculture quoted the low LD_{50} of Sevin, we replied that San Diego was not inhabited by healthy rats but by elderly and ill human beings, and that Balboa Park contained a center for the blind and was used by children's groups.

The public is equally confused: while labels advise caution, first contact with many pesticides for a healthy young adult produces discomfort, which soon passes. Slowly all pollution will erode health by damaging liver and kidneys or other organs to hasten that breakdown of organs associated with old age, but if a man's life is shortened, the subtraction comes from the end of his life, and as a youthful adult he is unaware. Sometimes advertising is confusing; for example, the Federal Trade Commission on May 7, 1974 prohibited pesticide makers from advertising their products as safe when labels admit problems. Union Carbide accepted consent orders agreeing not to advertise its pesticides Sevin and Sevinol as safe, nontoxic, and not harmful to children, nor to deny that its products will drift. 25

The Toxic Substances List, 1973 Edition, United States Department of Health, Education and Welfare, carries the cryptic symbol NEO, meaning that Sevin is tumor–producing. If long range effects were considered, this alone should make

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officials hesitate to use the material, for cancer is the modern scourge.

Indictment of Sevin as a birth-deforming chemical is contained in the report of the Bionetics Research Laboratories of Litton Industries in Bethesda, Maryland, under contract to the National Cancer Institute (NCI Contracts PH 43-04 and PH 43-67-735). The deformities listed are the gross deformities similar to those caused by Thalidomide—eyes missing or badly formed, lower jaw absent, skull defective with brain protruding, organs out of place, webbed toes or fingers, fluid in the ventricles causing separation of cranial bones, clubfoot, and cystic kidney. 26 *

Motivated by a desire to check the long-range dangers of common pesticides, which had been registered only with short-range data, HEW contracted this study in 1965 at a reported cost of $3.5 million. Important results were available by 1966, but the study was not finished until 1968. The results were so shocking that HEW did not release it to the public immediately. Finally Dr. Samuel Epstein, Chairman of the Panel on Mutagenicity of Pesticides in the Secretary's Commission on Pesticides and Their Relationship to Environmental Health (the Mrak Commission), pulled it out of hiding for use of his panel. It remained available to the public for a short time, but now is difficult to secure. However, it is summarized

* See appendix for tests from the *Bionetics Report*.

the report of the Mrak Commission. There are four volumes. If anyone wishes to test its status at present, he might try ordering all four volumes from HEW or the Superintendent of Documents, Government Printing Office. 27

When the Department of Food and Agriculture prepared the *Environmental Impact Report* 28 for the second summer of spraying, officials were familiar with the *Bionetics Report*, for we had already challenged them with it. Mutagenicity is difficult to discover: thousands of test animals would be required to secure a true test; however, scientists solve this problem by increasing dosage. The Department of Food and Agriculture secured a test done by Weil 29 that used a small dosage and a small number of animals, so that the results obtained in the *Bionetics Report* were concealed. It has become fashionable to say that later testing has superseded the *Bionetics Report* without explaining the exact meaning of the remark. Political objectives were served: spraying for Japanese beetles could go on as before, and no one had to criticize Union Carbide or its product. Nor does HEW act upon the hideous data contained in this report.

If one studies the work of administrative departments both of state and federal governments, one finds symptoms of split personality: there are dedicated scientists who do careful research, but do not govern policy. When something of horrifying import is revealed, leaders in positions of power favor the financial interest which manufactures the product rather than the unborn child. In fact, a

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favorite argument is that almost anything ... cause a birth deformity, and having thus demonstrated the delicate vulnerability of the human fetus, these leaders approve striking it a murderous blow with the most horrible poisons.

Addition of kelthane to kill an infestation of mites increased toxicity of the spray. The mite problem was brought on by spraying for Japanese beetles; formerly mites were under control by natural enemies, but destruction of beneficial insects had caused them to increase.

Kelthane is a chlorinated hydrocarbon (the DDT family), and like DDT is fat soluble and therefore stored in body fat. Like DDT it is persistent in the environment, since it moves and concentrates in the food chain. The petroleum distillate in which it is saturated also creates a problem, nor can one be sure of the effect of combining these materials with Sevin.

What of chlordane, the chemical scattered in granules and watered into soil in Balboa Park and surrounding residential areas? Note Dr. Arnold J. Lehman, Chief of the Division of Pharmacology of the Food and Drug Administration, speaking to a congressional committee in 1950: "At the residue hearings Dr. Ingle reported that rats receiving small amounts of chlordane in their diet for approximately one year developed nervous irritability and tremors when fasted for 48 hours. This was interpreted as due to the release of the stored toxicant. We had previously made similar observations in our laboratory with rats receiving DDT . . . . Starvation produced about the

severity of symptoms in Ingle's rats which had received 10 parts per million chlordane as star... of our rats which had received 200 parts per million DDT. On the basis of this type of test chlordane shows up as approximately 20 times as toxic as DDT.

"The ability of chlordane to produce liver injury in the rat is 2 to 5 times that for DDT.

"We have conducted some fat storage studies with chlordane. A toxic substance is stored in the fatty tissue and when the concentration is expressed as the equivalent quantity of technical chlordane, we find that storage is from 20 to 40 times the dietary intake. Under similar conditions DDT is stored 6 to 28 times the dietary intake." 30

In spite of all this information, chlordane was registered and became a common pesticide. After almost twenty–five years, on November 18, 1974 Russell E. Train, Administrator of EPA, initiated proceedings to cancel registration of chlordane.

Not even when chlordane decays is it safe, according to Train. He lists the toxic metabolites chlordene epoxide, found in the urine and feces of mammals or formed by soil organisms, and oxychlordane, formed slowly in normal liver tissue. Nor is chlordane a single material: it contains heptachlor, which in turn forms heptachlor epoxide, a highly toxic chemical.

"Residues of both heptachlor and chlordane can be picked up from the soil and translocated to various parts of plants," he continues. "Remnant residues are particularly significant in root crops such as carrots, potatoes and beets."

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What of the organic gardens saturated with chlordane? Should not these gardeners be warned that their soil is now lethal? Should not the teachers and parents of children in Roosevelt Junior High School adjoining Balboa Park be told that the soil of the playgrounds is saturated with this dangerous chemical to be breathed whenever dust blows?

The breakdown products of both chlordane and heptachlor EPA has found in human bodies, in the organs of stillborn infants, and in human milk. Thus the human being will be exposed during every part of his life.

"The present evidence of measurable quantities entering man's body and further being transferred to fetuses in the uterus indicates that humans are exposed to heptachlor epoxide from the moment of conception throughout life. . . .Humans, like the experimental mice and rats, may react to such exposure by producing malignant tumors." So continues the indictment by EPA. [31]

Can one assume that this story, common knowledge to anyone doing minimum research, is unknown to the Department of Food and Agriculture? We are sure that it is familiar, but officials apparently must have legal compulsion before they act. Cancellation of registration, the method chosen by EPA, invites delay, for the pesticide may be sold during the period of litigation by manufacturers that accompanies such efforts by the government. Suspension of registration, requiring immediate cessation of sales, was used for aldrin and dieldrin, but a loophole was left by giving

manufacturers permission to dispose of available supplies. The requirement that indemnity be paid for losses because of suspension of sales may influence EPA to take the slower method. However, continuance of chlordane in San Diego would have presented no problem to state officials. We find their attitude offensive and immoral that they did not protect the people of San Diego by accepting the scientific evidence that EPA had gathered. *

Throughout two summers of spraying, People's Lobby and the citizens working with us pleaded with everyone in authority to issue proper health warnings. Even the City of San Diego never obeyed the directions of the city council in this respect. Finally, People's Lobby mailed the following letter in July 1974 to people in the sprayed area:

"The Department of Food and Agriculture has promised that wishes of citizens not to have their property sprayed will be respected. According to state law, drift of pesticides from one property to another must be prevented. Legally your home is your castle, not to be entered against your will. If you do not want your property sprayed, do not be intimidated.

"The following warning of possible pesticide poisoning symptoms has been developed from

* Too late for San Diego people, on July 30, 1975, the news came over the radio that EPA has suspended registration of chlordane and heptachlor. This has been motivated by legal action by the Environmental Defense Fund.

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the Environmental Protection Agency label instructions for Sevin, a product of Union Carbide:

"Sevin is a health hazard and cannot be considered as safe. Allergic reactions may result in eye irritations, itchy rash, dry cough, severe headache, nausea, bronchial and nasal irritations, and possible vomiting. General flu symptoms such as weakness, dizziness, abdominal cramps, diarrhea, and sweating may occur. Older persons and infants, anyone having a history of heart disease, bronchial congestion, or liver damage, or anyone taking medication for depression may react violently and should leave the vicinity and stay out of the area for at least two days.

"Morton Biskind, M.D., of Westport, Connecticut, states that 'Sevin has been found to damage testes, ovaries, and pituitary. . . .The function of the thyroid gland and the oxidative ability of both brain and liver are seriously impaired.'

"Chlordane, applied to soil, may cause irritation of the skin, or symptoms similar to flu may develop, especially if one sits on the ground. Chlordane has been called four to five times more toxic than DDT by A.J.Lehman, M.D., Chief of the Bureau of Toxicology of the Federal Drug Administration. Since it is not water soluble, it is not readily removed from the soil or leached downward." 32

A survey prepared for the city council by random sampling of opinion of people in the sprayed areas, observation of the crews at work, and questioning of crews indicated that the crews attempted to inform citizens ahead of time, but that there

been instances of spray drifting through open or spraying while children stood on the Of course, it is impossible to apply pesticide in cities without violating state law against from property to property. Seemingly the of the people in San Diego indicates it is impossible to apply general spraying to a without endangering health of residents, and pretense that the opposite is true results in in the application of the pesticides workmen are told that the pesticides are 33

The following letter from Frank Porter, an employee of the State Department of Food and Agriculture, shows violation of regulations of the Occupational Safety and Health Act concerning welfare of workmen:

Imperial Beach, California
September 18, 1974

TO WHOM IT MAY CONCERN:

'I was employed in the Japanese beetle program by the State of California during the summer of 1973 and the summer of 1974 until August 1, 1974. I worked on a spray rig, surveyed plants for beetles and beetle damage, and checked traps when I observed them in yards.

"We were told repeatedly that both Sevin and chlordane were safe. In 1973 employees applied chemicals without protective clothing. We had no coveralls, hard hats, or gloves, and were not

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required to wear long–sleeved shirts. At no time were any precautions given. In 1974 we were furnished coveralls and gloves, but no masks, so the workers breathed the spray constantly.

"In September 1973 while applying Sevin on a very windy day, I suggested that spraying should stop because of the wind. However, spraying continued. My clothes became wet with spray blowing against me, and I breathed it constantly. I became nauseated and light–headed, so that I had to sit down on the lawn. I was not taken to a doctor.

"In 1974, when I was applying chlordane granules to the soil in the Wilson Street area about one o'clock in the afternoon, I became nauseated and dizzy. I was not taken to a doctor. There was no interest displayed by anyone on the job. Chlordane is applied in a seeder, and dust blows readily.

"I have observed employees in the office disregard telephone complaints.' 34

(Signed) Frank J. Porter

Regulations regarding care of employees' health are explicit, and every rule was violated with this employee: no cautions were given about handling pesticides, no protective clothing or masks were provided until 1974, and then they were inadequate, and no medical attention was furnished a sick employee. When Mr. Porter called to say that he was sick a few days later and remained off the job for two days, he was discharged.

PEOPLE'S LOBBY PROPOSES A LESS TOXIC PROGRAM

Early in the program, while chlordane was still being applied widely, People's Lobby made a proposal that we still regard as reasonable. We said this: let the milky spore disease be used on turf instead of chlordane, let citizens in threatened areas water turf lightly, and let a study be made of the survival and pest potential of Japanese beetles in this climate and soil. The response to this was a screaming, hysterical newspaper campaign by the Department of Food and Agriculture stressing the theme that the Japanese beetle would devastate agriculture, because it was a general feeder. Then a team of experts from the United States Department of Agriculture was flown from Washington, D.C. to conduct a session with San Diego people to convince them of the virtues of chlordane. They succeeded only in selling the idea that the federal government is as deep as the state government in this eradication racket, and that these so–called experts had never read the research that Environmental Protection Agency now intends to use in the court actions regarding chlordane and heptachlor.

HOW VALUABLE ARE NATURAL ENEMIES?

The true measure of the danger of any pest is the impact of natural enemies to control it. Therefore, we read with interest the following account

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of the Japanese beetle in the *Yearbook of Agriculture*, United States Department of Agriculture, 1952:

"The fact that the beetle, although common in Japan, was not a pest of much importance, suggested the existence of insect or other enemies which kept it under control. A search for enemies of the beetle in Japan and elsewhere was carried on from 1920 through 1933. It was found that a relatively large number of insect parasites and predators attacked the various stages of the Japanese beetle and related species. About 49 species of insect parasites and predators were shipped to the Department's laboratory in New Jersey from Japan, Korea, Formosa, China, India, Australia, and Hawaii. Some parasites were released immediately into the beetle-infested area. Others were used for further study or reared to provide additional parasites for subsequent release.

"Five species of imported insect parasites have become established in the beetle-infested area. Two of these, the spring Tiphia *(Tiphia vernalis)* from Korea and the summer and fall Tiphia *(Tiphia popilliavora)* from Japan, are well established and are one of the important causes of a decline in Japanese beetle numbers in the older infested area. Both parasites are wasps that attack the grub of the Japanese Beetle. The wasp lays an egg on the body of the grub. The maggot that hatches from the egg feeds on the grub and destroys it. The first colonies of the spring *Tiphia* were released in 1926 in New Jersey; by 1951 a total of 2,018 colonies had been released in 14 states from New Hampshire to North

Carolina and westward to Ohio. State authorities, using wasps collected locally from the sites of earlier releases made by the Department, released several hundred additional colonies. The fall *Tiphia* was first released in 1921 in New Jersey; by 1951, 767 colonies were released in nine states.

"Early observations indicated that the grubs were subject to several diseases. About 25 different soil microorganisms can cause some stage of the Japanese beetle to become diseased. Among these are bacteria, fungi, protozoa, nematodes, and viruses. The bacteria causing the milky spore diseases of the Japanese beetle grubs were found to be the most important of the organisms. These are spore-forming bacteria, *Bacillus popilliae* and *Bacillus lentimorbus*. The former, the more important, causes the type A milky disease.

"Another disease found in Japanese beetle grubs is the blue disease, so-called because of the bluish tint of infected grubs. Its causal organism is believed to be a virus. The disease is believed to be very potent and may lend itself to large-scale utilization in much the same manner as the milky disease.

"Several species of nematodes, tiny microscopic worms commonly found in the soil, cause considerable mortality among the grubs and are an important factor in biological control. Their effectiveness depends much more on favorable climatic and soil conditions than do the milky diseases, however.

"Several species of fungi attack the Japanese beetle. The most important is the green muscardine

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fungus, *Metarrihizium anisopliae.* It is widespread and under favorable conditions is important in the biological control of the beetle."

The milky spore disease has become a common item for sale in nurseries throughout the beetle-infested areas in the United States–the Atlantic Coast and westward to the Mississippi River. It contains spores mixed with a filler, and is applied by placing it on the ground in small piles and watering it into the soil. Entirely nontoxic to human beings, it continues to be effective for a long period as it spreads through the soil inoculating both Japanese beetle larvae and larvae of other similar insects, such as June bugs. [35]

The life history of beetles makes them especially vulnerable to this disease. Female beetles lay their eggs in grass roots in the soil in summer. The grub stage starts in midsummer or late summer and continues until the change to pupa late the following spring. The cycle from egg to adult beetle lasts nearly a year. Japanese beetles may be stricken with the milky spore disease at any time during the long span of grub life.

We followed the recommendation of Dr. Robert van den Bosch, chairman of the Division of Biological Control, University of California at Berkeley, in asking for the use of milky spore. The infestation was minor: only eleven living beetles were found the first summer, and there was no beetle damage to plants and no grubs, although a city crew dug vigorously for them in 1974. There was no emergency except in the minds of the state officials. Instead, there was time to do a study of

the Japanese beetle's ability to survive in the climate and soil of San Diego and to examine the question of whether in this habitat it would be an important pest. Such considerations are of vast importance in every eradication program.

The experts from Washington had two reasons for refusal of milky spore: they said that the USDA had decreed that chlordane was the only acceptable treatment, and that milky spore was too expensive, since it cost $16,000 per acre. We telephoned the Fairfax Biological Laboratory, Clinton Corners, New York 12514, and received a quotation of $67 per acre. [36] This would purchase a ten-pound drum. Obviously a small amount would spread the disease in soil well populated with grubs, and a larger amount would be needed if grub population were minor, but the discrepancy between figures was far too great. Besides, the Department of Food and Agriculture, according to the *Environmental Impact Report* of 1974, planned to spend $1,500,000 in eradicating the eleven beetles and their progeny.

We searched the literature further, and discovered that Japanese beetles do not do well in dry areas, so that they could not live in the wild lands of San Diego County, and that their multiplication in irrigated land would depend upon the amount of water applied.

Note the following statement from the *Bulletin* of the Department of Food and Agriculture:

"California, unlike other Japanese beetle areas, does not have summer rainfall. The Japanese beetle requires ten inches or more of summer

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rainfall, or a comparable amount of irrigation water, to thrive. Without several inches of water during the summer months, it is doubtful that the beetle would survive." [37]

Here from the Department of Food and Agriculture itself was a method of avoiding a city bathed in poison. We proposed that residents in the threatened areas might withhold water from lawns during the critical months of summer. When we scanned water bills, it was our opinion that we did not apply an equivalent of ten inches to lawns in summer. Officials, thinking perhaps of the horrors about to be perpetrated by the eleven beetles or perchance of the $1,500,000, sternly refused even to try our plan for a single summer. Nor did they yield when we cited the problem of a Japanese beetle trying to lay its eggs in the dry adobe soil of the San Diego hills when it really needed moist loam soil. The United States Department of Agriculture decreed chlordane and Sevin, and federal officials dominate and lead these eradication programs.

Presently we began to experience the raw power of the Department implicit in the word *emergency* in Section 224(2) of the Food and Agriculture Code. This is a sample of letters that were sent to citizens resisting spraying:

"Our office has been advised that you have refused to permit employees of the Department of Agriculture or the County of San Diego to enter upon your property for the purpose of conducting an inspection and, if necessary, spraying to prevent the spread of the Japanese beetle. We are sure that

you are aware of the fact that the portion of San Diego County in which you reside has been proclaimed a Japanese beetle eradication area under the provisions of Section 5321 of the California Food and Agriculture Code. Pursuant to this section the areas of the county which have been found to be infested have been declared to be a public nuisance and as such are subject to all laws relating to the prevention and abatement of nuisances.

"It is our sincere hope that your refusal to allow employees of the Department of Agriculture or the County of San Diego on your property is the result of a misunderstanding and not the product of any desire on your part to violate the law. This being the case, we are sure that you will allow the duly authorized officials to enter upon your premises for the limited purpose of preventing the spread of the Japanese beetle." [38]

The letter was signed by Lloyd M. Harmon, deputy, for Robert G. Berry, County Cousel, San Diego County. We had an oral promise from those heading the spraying that those with health reasons for refusing spraying might put signs on their property to this effect, and that spray crews would avoid their property. However, there was no general publicity given to this method of dealing with the problem of illness, and many were threatened with court orders if they resisted.

Then, attempting to deal with the health problem, we proposed testing the insecticide Polytrap, a nontoxic material used for three years around the San Diego zoo. [39, 40] Polytrap is a

wax, Polyisobutylene, which is in common use sprayed upon apples and cucumbers to make them shiny and prolong shelf life. It is also an ingredient of bubble gum. When it is sprayed upon plants, insects, eating the leaves, find their mandibles gummed together, so that they no longer can chew or eat. Since it kills by mechanical means rather than toxicity, it is harmless to mammals. George Swink, a retired farmer now living in La Jolla who formerly had farmed 10,000 acres in the Imperial Valley, tested it by air application to a number of crops there with good results. [41]

When we asked state officials to implement the word *research* in Section 224(2) by testing this insecticide on Japanese beetles, we met instant resistance. Kenneth Little, the agricultural commissioner, said that it could not be done, because Polytrap was not registered at the federal level for Japanese beetles. [42] He was in error. Research always is done on unregistered materials or unregistered uses, since scientists are constantly exploring new fields; furthermore, the Food and Agriculture Code exempts state scientists from restrictions governing private citizens.

At that time the State of California conducted its own registration, and could have undertaken experiments preliminary to registration. Since the state already had registered Polytrap for use against several pests attacking two kinds of flowers, it seemed reasonable to suppose that it might destroy other pests. As an antitranspirant, checking water loss from plants, so that they do not wilt when transplanted, it could be sold without registration.

However, in 1974 registration was preempted by the federal government. For further success in registration a political–financial problem had to be solved. A nontoxic, broad–spectrum pesticide reputedly protecting beneficial insects might offer farmers a way to avoid dangerous, highly toxic pesticides made from oil; therefore, all officials should have been eager to extend its use. On the other hand manufacturers of these very toxic pesticides base their enormous sales on destruction of beneficial insects, so that all control is chemical. If the manufacturer's claims for Polytrap were verified by research, this was confrontation between two approaches to pest control. Although farmers might save themselves, mighty corporations would lose money. The result? Polytrap no longer is sold, and a new antitranspirant, manufactured by Ortho, is offered customers.

The Battle of the Beetle, as it was known, had long ago become political, and had little to do with entomology. The city council had followed events with interest, and some of the interchanges had taken place in council meetings; on April 2, 1974 the council passed a resolution that adequate health warnings should be given, that community–wide publicity should be given the eradication project, which should include the potential hazards to human beings and other forms of life, and that spraying in Balboa Park should be done so as to minimize inconvenience to the public, and to provide adequate posting, cordoning off and patrolling of this park throughout the period during which a health hazard exists. [43]

Leon Williams, chairman of a subcommittee of the city council, broke the custom of allotting only five minutes to present citizen testimony and gave us three hours to review the subject. At the end of the session, the subcommittee voted unanimously to have the city seek an injunction to bring the beetle eradication project to an end. Meanwhile the *Environmental Impact Report* had been issued by the Department of Food and Agriculture saying that $1,500,000 was to be spent on eradication of beetles in San Diego. The confrontation had come.

Plainly there had to be political skulduggery to sink this subcommittee action. Pete Wilson, as mayor, had little more power than other council members, but he had increased his influence by appointing study committees; the right to appoint a committee carries with it opportunity to govern decisions by judicious choice of appointees. There was the Quality of Life Board and the ad hoc pesticide committee, billed as experts but really composed principally of biology teachers in local colleges. Tactfully these groups had compiled a report giving a blessing to the entire spraying project, and placed it in the hands of the city manager. This was good ammunition.

Then there was another demonstration of raw power by the Department of Food and Agriculture and the agricultural commissioner, who works under direction of the Director of Food and Agriculture. The employees of the County Department of Agriculture, perhaps motivated by Sacramento officials, telephoned every nurseryman in the county asking support for the Japanese beetle

program. If nurserymen failed to give that support and the program was cancelled, they were told that the entire county would be quarantined. [44]

"Nurserymen and florists said that they felt caught between the city and the county," a news item in the *San Diego Union* reports. "Peter Doty of White Front nursery said that he 'feels used. I never got the name of the man that called me from the county. But it was evident that they wanted us to pressure the city to turn down any legal action. I do know that it would cripple us.'

"Brian Pendergast of Consolidated Floral Exchange, a major supplier to florists in the proposed quarantine belt, said, 'No florist in the area would be able to sell a plant.' "

Of course, this was nonsense. The United States Department of Agriculture has faced this problem as Japanese beetles have spread over the country, and requires florists in quarantine areas to put certain pesticides in the soil for plants to be sold. Business goes on as usual.

The full power of the attorney general was exerted against the people of San Diego. A letter came from Evelle Younger, signed by his deputy Denis D. Smaage, warning the city not to undertake legal action. [45] Evelle Younger, then, sent another deputy, Anthony Summers, to San Diego to dominate the city council meeting. Pete Wilson, cooperating with Mr. Summers, used his position as chairman to center discussion only on abuses of power and to limit citizen proponents of legal action to only fifteen minutes of testimony. Officials of the Department of Food and Agriculture

were questioned sympathetically and at length. The report of the Quality of Life Board was brought forth. The nurserymen, a frightened, coerced group, swelled the audience. John Witt, city attorney, evidently coached by Mr. Summers, spoke against legal action. The subcommittee of the city council, who had voted for legal action, was not permitted by the chairman to make a report. Singly, then, Pete Wilson decided that there had been no abuse of power and adjourned the meeting. This travesty of a hearing underlines what many have experienced. When severely pressed, officials at the center of power move into a solid phalanx, each protecting the other and facing the people as enemy.

From June 26th to July 25th, three more beetles were found in traps. One near the airport was alive, another on Wilson Street about a mile from the Balboa Park sprayed area was dead, and a third near the public library downtown was dead and had parts of its body missing, so that it could not have flown into the trap.

The dead beetle brought about the spraying of Mr. and Mrs. Victor Goldfaden at 3851 35th Street. Located away from the previously sprayed district, they were unprepared for the spraying. She was 68 and suffering from emphysema, hyperglycemia, and osteoarthritis of the spine. Her husband, 78, seemed frailer then his wife and recently has had a heart attack. During June and July of 1974, they had spent $2970 on medical bills. They had doctor's statements that they must not be subjected to spraying. Mrs. Goldfaden's letter from

doctor, Rudolph Alsleben, M.D., reads as follows:

"Mrs. Goldfaden has been treated in this office for arthritis and other ailments. She said her health had improved as a result of these treatments, and up to the time of the insecticide spraying she felt pretty good. Unfortunately as the spraying continued, she complained that her condition became progressively worse. After the last spraying, she developed a long list of symptoms, including itching of the eyes, abdominal pressure, severe headaches, poor concentration, and many others. My patient tells me that she feels as if she is being slowly poisoned.

"In view of the above, I respectfully request that there be no further spraying around her house. If not, all the benefits of the many treatments will be lost and her physical and mental health may deteriorate to a critical level." 46

All this made no impression on the spray crew, who repeatedly sprayed a tree directly outside their windows. Telephone calls to everyone in authority brought no response; in fact, it had become the habit of those working in the spray programs to disregard complaints and then to say that no one had really proved to have a problem. Finally she was able to reach a person who would listen and to escape only one spraying at the end of the season. At one time she was threatened with court action. Meanwhile citizens continued to telephone the city council with an increasing number of complaints.

Finally public opinion no longer could be

ignored. Although Evelle Younger sent his deputy a second time to the council meeting, it was in vain. A parade of witnesses recited their experiences and demanded that the spraying stop. Mrs. Goldfaden stood erect testifying in a quavering but defiant voice of her own and her husband's illness. The city council, with Pete Wilson dissenting, voted to seek an injunction against the Department of Food and Agriculture, State of California, and the County of San Diego to end the eradication program.

But those who wished to play a game of manipulation had other methods. John Witt filed the case next day with no supporting facts for his declarations. When perforce the temporary injunction was denied, he put on the case a law student just graduated, who was unfamiliar with the issues and the two-year struggle that had preceded it. This young man used old precedents, including one that had been lost in a previous appeal, and refused to take complaints unless physicians would testify that all health problems suffered by their patients were due to this particular spraying. The result was a case so meager and so hastily assembled that the judge commented that he wondered if the City of San Diego wanted an injunction.

WAS THE PROGRAM A HOAX?

Were the beetles moved into San Diego wilfully to create this eradication program? Were they designed to make jobs? Was the entire affair a hoax? It was not ourselves,the opponents of the program,

Kenneth Little, the San Diego County Agricultural Commissioner, who first spoke of this matter.

On September 8, 1973, the subject came before the city council:

Leon Williams, councilman: "How did they happen to be there? And how they got there without anybody. . . "

Kenneth Little: "Well there are two theories. One is the aircraft theory. It is known that they will survive a trip across the country on the outside of an aircraft. That is, in the wheel well. In Balboa Park the landing pattern is right over the south end of the park. They could drop from there. Also one day we made a quick count, and we found there 8 recreational vehicles in the zoo parking lot from the 22 states that the Japanese beetle is known to infest. It is very easy to bring it out, because Mr. McGuire is finding that some of the Japanese beetle traps that he is running have actually been what we call salted, in that people are placing Japanese beetles in the traps and these are not fresh beetles. These are old and this is hampering our program considerably."

Williams: "Why are they doing this? Why are they salted?"

Little: "You can salt a gold mine. You can salt a beetle trap."

Floyd Morrow, councilman: "I guess I shouldn't be shocked at anything, but why in the world would somebody. . . . . And how did they know it was a Japanese beetle unless they were pretty expert at it?"

Little: "Well, apparently they are pretty expert

at it."

Morrow: "You mean they . . . . . To sell [illegible] of insecticides? Could you speculate. . . . Obviously if you had a scarcity of them and you were selling insecticides, then you would set up a [illegible] manent. . . ."

Little: "Well, I don't think that is the purpose of it. I think it's some people, as mentioned, would turn in a false fire alarm. They can go back [illegible] and pick up the beetles; within a day they can be out here and put them in the traps. If they are knowledgeable enough to know what a Japanese beetle trap is." 47

The subject fascinated the city council and they kept returning to it. On April 1, 1974, there was the following conversation at a council meeting:

Kenneth Little: "All right, in reply to your first question, how many Japanese beetles were actually found. There were seventeen beetles found. These have been identified by the taxonomist of the California Department of Food and Agriculture. Of the seventeen, nine of them were alive. They were found alive in the rose garden to the north of the Natural History Museum of Balboa Park. The remainder of the–one more was the original find that was picked up at the intersection of Alabama and Upas Streets by the lady who made the original find." 48

In Sacramento in the eradication project in 1961, the same rumors of planted beetles had arisen, and beetles had definitely been found with parts missing so that they could not have flown

the traps, as had happened in San Diego. 49

Then we received a copy of a letter that Sandra [illegible], an employee of the beetle program, had sent to Bob Anderson, State Department of Agriculture, stating that her supervisor, Russ Skillman, had called the project a hoax, and that another employee, Dave Reyes, had noted that John Lineberger was about to be discharged, when his crew found the beetle and activated the department. 50 *

The letter from Frank Porter previously quoted explained the beetles with missing parts. "After the project had continued for about two weeks, two girls and I discovered that there were dead beetles and larvae in the containers in which the traps were shipped," Porter writes. "We cleaned out the traps and containers. Mr. Routhier told us not to say anything about this. The workers in the office knew about the dead beetles in the traps. There was no general order to clean out all the traps in the field."

We wonder why Mr. Routhier, supervisor of the program, did not want this information to leak out, and why he did not order the traps in the field to be cleaned. The number of beetles found that first summer was important, for upon this was based the scope of the program. First the public was told that seventeen beetles had been found, then Mr. Little disclosed under questioning by the city council that of these only nine were living, and

* See appendix.

finally that some dead beetles were so damaged that they could not possibly have flown into the traps. The depositions filed by the Department of Food and Agriculture in the court case stated that there was a total of twenty–four beetles, but of these seven were discarded because of missing parts, and of seventeen remaining only eleven were alive when found. * The Department of Food and Agriculture argued in the deposition that the dead beetles had no pin holes to show that they belonged to a collection, and therefore, though dead could be accepted as valid specimens, increasing the scope of the infestation. Perhaps some of the dead beetles that Mr. Routhier left in the traps might have fallen into this category?

Spending is generous in these eradication projects, and the work more pleasant loitering than hard labor. A total of $856,591 already had been spent during two years of beetle eradication in San Diego, and $355,000 is budgeted for the 1975–1976 fiscal year. 51 The gathering momentum of eradication projects and the availability of the million–dollar fund have assembled a group of men who make their living from this employment. They are not scientists, but have considerable expertise in laboratory work and identification of insects. If projects recede, they would have difficulty in obtaining similar employment. In this matter, no reference is made to college students

* See appendix for deposition filed by the Department of Food and Agriculture.

anticipating only a summer of employment, but to full-time employees, moving from program to program and always centering upon eradication. It is important to such men that eradication projects continue and expand. As has been shown earlier, there are not enough new infestations each year to justify spending the million dollars, so that these men would be beset with job anxiety. What if a year came without new pests, and the old programs were running down?

The policy makers in the Department of Food and Agriculture planned a whitefly eradication project in San Diego doomed to failure because whiteflies were established just across the border in Mexico. Further to increase scope of their work, they needlessly carried out the grapeleaf skeletonizer program against an insect already under biological control and spread to almost every area in the state, and then attempted to fund the program forever by taxation of the industry. By the same reasoning, why could a man not ensure himself a job with a handful of beetles? When we examined the list of beetles submitted as part of the depositions from the Department of Food and Agriculture in the court action, we found 11 living beetles discovered from July 20th to July 26th, and only dead beetles throughout the rest of the summer. Were the eleven living beetles a shipment discreetly scattered or a valid infestation? When we refer to "salted" traps, we are thinking, not of insects from a collection, but of beetles shipped by airmail. Farmers, brooding over their increasing insect problems, have speculated about this subject. If these

infestations are worth millions, would not some
seek to increase them? Has not the state's conce
tration on eradication created a new and extra
dinary crime?

It seemed to us that we had seen the tip of th
iceberg, a health Watergate meriting investigation
and for that reason we turned the matter over t
the San Diego County Grand Jury. Instead, appa
ently no one except Russ Skillman was questioned
those who desired the investigation and had as
sembled information were not summoned, and
public viewing of the transcripts of testimony wa
refused. This was a whitewash rather than a search
ing for facts. For verification of this matter, we
have appended the Grand Jury report sent to Ed
Koupal and the dissent by Virginia Taylor.

Meanwhile, Mr. and Mrs. Goldfaden wait in
fear of the next spraying. One dead beetle any
where in a trap will trigger it, and provide a reason
for spending the $355,000 budgeted for this year

CHAPTER VII

THE COMSTOCK MEALYBUG

This letter dated April 22, 1975 from Dr. I. M.
Newell, Chairman of the Division of Biological
Control, University of California, Riverside,
contains such valuable comment that we offer it

your consideration:

April 22, 1975

Mrs. Tallian:

Thank you for your inquiry about the status of
radication and biological control programs being
arried out jointly by the University of California
nd the State Department of Food and Agricul-
ure. First, I should reiterate that the California
epartment of Food and Agriculture is charged
ith the responsibility of detecting and eradicating
ewly introduced pests in the State of California.
he role of the University is to conduct research. I
m quite familiar with two of the eradication pro-
rams presently or recently being carried out by
he California Department of Food and Agricul-
ure, namely, the ones on woolly whitefly and
omstock mealybug, and will confine my reply
rincipally to these two pests.

I first learned of the eradication program against
he woolly whitefly in San Diego County in 1970,
when I became Head of the Division of Biological
Control of the University of California, Riverside.
From the outset I felt it was ill-advised, as the
pest was firmly established on both sides of our
border with Mexico, where it is relatively wide-
spread, but a fairly innocuous insect, under virtu-
ally complete biological control by its natural ene-
mies. Nevertheless, the eradication program was
continued for four more years, being terminated
only in 1974, when the futility of the program

became obvious to all but the most ardent supporters of "eradication." I have no idea of the total cost of the program, but it must have been enormous. From 1970 through 1974, the University received funds from the California Department of Food and Agriculture, with some additional support by the citrus industry for research on biological control of woolly whiteflies.

Although small in proportion to the cost of the eradication efforts, the biological control program developed to date by University researchers shows promise of ultimate success, and is the only tangible benefit to the state of the (probably millions of) dollars invested in the woolly whitefly "eradication" program.

We are concerned, of course, that support of the biological control program by California Department of Food and Agriculture has been terminated now that the "eradication" efforts have been dropped. Special legislation has been introduced to continue this work for one more year, but there is presently no certainty that this will be approved.

The biological control program against Comstock mealybug in Tulare and Kern counties is slightly different. This, also, has been supported for a number of years under the umbrella of an eradication program. Unlike the woolly whitefly eradication project (which I personally felt was a mistake from the beginning), I supported the eradication program against Comstock mealybug because it was a

relatively isolated infestation, and because our preliminary data indicated some uncertainty about the ability of the natural enemies of Comstock mealybug to hold infestations to economic levels. But after four seasons of intensive work, we now have the beginning of what might develop into a successful program of biological control against this pest. However, it will require several more seasons of research to be reasonably certain of this, and there is considerable doubt that the biological control work on this pest will be supported by California Department of Food and Agriculture for more than another year, and at the moment I'm not sure about that.

We have been told on a number of occasions, in one way and another, that the name of the game is eradication, and when that is dropped there is no way that biological control research can be supported by California Department of Food and Agriculture. I prefer to say no more about this here, as I am still hopeful that an amicable (and satisfactory) solution to our present impasse with California Department of Food and Agriculture can be found. It is my personal professional opinion that Comstock mealybug cannot be eradicated from the San Joaquin Valley, and that any funds expended,from here on, toward that end will be wasted. I am not certain what the projected "eradication" program of California Department of Food and Agriculture will be, in the case of this pest.

I am only peripherally acquainted with the "eradication" program on Grape Leaf Skeletonizer, though I have known of the program against this pest for the past 23 years at least. It is not, and in my estimation, never has been a bona fide eradication program, and should not be supported further by the State of California.

Again, let me thank you for your interest in biological control.

Sincerely yours,

I. M. Newell, Head
Division of Biological Control

CHAPTER VIII

BEET LEAFHOPPERS FOREVER SPRAYED

No pest should be a permanent target for spending; therefore, People's Lobby questions the inclusion each year of a large sum for spraying beet leafhoppers. In the 1975–1976 budget $232,312 is allocated with additional funds assessed against the industry by mandatory legislation.

The problem is that the beet leafhopper is a

of a disease called curly top, which is carried plant to plant, causing damage to sugarbeets other crops. Since leafhoppers are found in stage throughout the winter, they need winter host plants, which they find in the desert surrounding cultivated areas. Therefore, spraying Russian thistle in the deserts of the San Joaquin and Imperial Valleys prevents this pest from moving into cultivated fields. While this may alleviate the problem, it forces the state and the beet growers to spend large sums annually, and commits them to heavy spraying.

This problem should be regarded as unfinished, and money assigned to the Division of Biological Control for further research. Considerable work already has been done in biological control of this pest, and several predatory and parasitic insects have been found attacking leafhoppers. The big-eyed bug preys upon this pest by sucking out its body juices, and three groups of internal parasites–the big-eyed flies *(Dorilaidae)*, the parasite wasps *(Dryinidae)*, and the twisted-wing parasites *(Strepsiptera)*–attack the nymphs and adults of beet leafhoppers, according to Dr. J. B. Douglas and Dr. William C. Cook of the United States Department of Agriculture.[52]

The suggestion has been made that an insect might be introduced that would feed exclusively upon desert host plants of leafhoppers and thus break their life cycle. This proved the answer to the threat of the Klamath weed in northern California, destroyer of cattle ranges. This success put into practice successful research by the Division of

Biological Control. While no one can predict exactly how research will proceed to check the hoppers, there is every reason to believe that answers will be found.

CHAPTER IX

THE ORIENTAL FRUIT FLY

People's Lobby has nothing but praise for the Oriental fruit fly eradication in San Diego, because it was successful without health danger to residents. This must be done if such projects center in densely populated areas; nor should rural people be denied equal protection. Health of human beings must be the first consideration; it is in faith that scientists able to travel in space will have in their ranks entomologists able to avoid poisoning old ladies and children. The Oriental fruit fly program demonstrated such competence.

The technique was perfected in Hawaii by cooperative work by the State of Hawaii and the United States Department of Agriculture, and its success was demonstrated by the eradication of fruit flies on the Island of Rota in the Mariana group. An attractant, methyl eugenol, lured fruit flies to a poisoned surface. Therefore, in San Diego workmen squirted this substance on telephone poles and

objects, but conducted no widespread spray- There were no helicopters spraying pesti- no protests to the city council, no letters to state director, no suits filed; instead, all was sunny.

the bait–poison method of destroying insects should receive careful consideration. Sometimes the pesticides are used, but if kept out of the environment, do little harm. The lure may be food or sex, but the latter is more enticing. In the insect world, odor identifies the sex object, and if scientists can isolate and reproduce in the laboratory the material which arouses sex desire, they have an attractant. Also each species has its own odor, so that selective pesticides may be produced. If a control program could be planned, attractants for major pests might be discovered and synthesized, and a new and important method of pest control would become reality.

However, companies now manufacturing pesticides do not find selective pesticides money–makers, since only small quantities are sold. This is said merely as a statement of reality and without thought of criticism, because these manufacturers of pesticides, like everyone else, live under the profit system, whereby they must seek maximum sales. This is best accomplished by sale of the most toxic pesticide, capable of killing all pests and all beneficial insects, and by application of this deadly material by airplane, the method most wasteful of material. Although such policy may be in conflict with public welfare, the companies choose it lest they find themselves reducing the stockholders'

profits. Such is the harsh reality under which everyone lives.

If the people are to survive this chemical age they must depend upon their government to be independent of these financial considerations and the government which must research such nonchemical methods as use of attractants, and very probably undertake their manufacture.

CHAPTER X

EMERGENCIES WANTED

The plain fact is that there is not a million dollars of emergencies annually requiring eradication of plant and animal pests in the State of California yet, officials in the Department of Food and Agriculture have dedicated their lives to spending this money. Much depends on their ingenuity in spending–a large staff has been assembled, crop sprayers need work, beneficial insects knocked out will increase use of pesticides. Of course, the money might be allowed to revert to county commissioners for--I almost said wasting–but what administrator worth his salt would permit others to get their hot little hands on so considerable a sum.

Therefore, there must exist in the department budget padders, who labor to justify spending this money. It was this conviction that led me to ask

items were included in the million–dollar for the four years from 1970–1971 through 1974. The following letter from Gregory budget officer, dated July 7, 1975, lists items:

	1970–71	1971–72	1972–73	1973–74
Livestock				
Mealybug	$28,197	$269,031	$478,567	$176,298
Pierce's				
Disease	------	299,777	267,817	------
Curly Top				
Virus	------	15,052	------	------
Reclaim				
Halon	------	4,241	16,497	------
Venezuelan				
Equine				
Encelpha-				
lomyelitis	------	173,396	------	------
Broomrape	------	188,344	102,853	------
Woolly				
Whitefly	------	------	18,000	165,257
Poultry Virus				
and Genetic				
Research	------	------	------	* 15,988
Japanese				
Beetle	------	------	------	*287,397
	28,197	949,841	883,734	644,940

* Total cost not yet complete

The $1,000,000 emergency allocation under Section 224(2), unclaimed gas tax, was not available prior to the 1970–71 fiscal year.

During the first year that these funds were available, the budget padders were not experienced in

their work. In later years there is a distinct improvement; however, the 1973–1974 fiscal year would have been a lean one without Japanese beetle.

According to the rules of musical chairs funding as explained to People's Lobby, only pests new to the department can be counted in this part of the budget. Why,then, does the curly top virus appear? This is a perennial spraying centering upon destroying beet leafhoppers in desert areas, and has been carried on for years, but usually financed from the general fund plus contributions from the industry.

After puzzling over the figures in Mr. Heath's letter, I added those items that seemed to be emergencies and secured a total of $693,955, but the items appearing a second time and therefore not emergencies equalled $1,509,372. Yet it is my understanding that this legislation was presented to the legislature because of the overwhelming number of emergencies. When Dr. Robert van den Bosch, chairman of the Division of Biological Control, Berkeley, asked the director for funds for control of the alfalfa weevil, he was told that the department knew about the pest previously and therefore could not touch the problem. Also funds must center upon eradication. Whether this is a rule implicit in the legislation or a state of mind, I do not know.

What seems clear, however, is that there is no real reason for an annual mandatory appropriation of a million dollars. These men in the Department of Food and Agriculture might be reasonably good fellows if they did not have the burden of this huge boondoggle.

THE GOVERNOR'S BUDGET FOR 1975--1976

The spending of over a million dollars for the 1975–1976 fiscal year remains a mystery; it awaits the appearance of emergencies. However, the following figures appertaining to the general fund are included in the Governor's budget for this year just beginning: Japanese beetle $355,868, Comstock mealybug $730,368, woolly whitefly $63,351, beet leafhopper $641,794, and Oriental fruit fly $38,071. The grapeleaf skeletonizer has disappeared from the budget, and the plan to have the grape industry fund its eradication seems to be lying quiescent for another year. Because of opposition of grape growers, the men of the department have decided not to spray vineyards but hope to mount a campaign in city areas. May this boondoggle rest in peace.

The entire subject of agricultural appropriations is confused by the fact that funds are used from the general fund and from affected industries, as well as this allocation of one million from the gas tax. Also certain funds from counties are sometimes made available. Conscious of the differences, I have reported each time what figures have been furnished by the department. The entire subject should motivate investigation by the Finance Committees of the Legislature.

CHAPTER X

REPEAL EMERGENCY FUNDING

Recommendations For The Department Of Food and Agriculture And The Legislature State of California

I. To check abuses in the use of funds and administration of eradication programs for insect pests People's Lobby recommends that the Legislature take the following action:

(1) that Section 224(2) of the Food and Agriculture Code be repealed. This section follows:

224. Transfer of money from the motor vehicle fuel fund; expenditure: Money transferred from the Controller to the Department of Agriculture Fund from the Motor Vehicle Fuel Account pursuant to Section 8352.5 of the Revenue and Taxation Code shall be expended by the Director of Agriculture as follows:

(2) One million dollars ($1,000,000) each fiscal year is hereby appropriated to be used for emergency detection, eradication, or research of plant or animal pests or diseases, during each fiscal year. The Director of Agriculture may expend such funds with approval of the Director of Finance. At the

end of each fiscal year any unemcumbered balance of such funds shall be added to the amount available for payment to counties during the fiscal year, as provided in subdivision (3).

(2) that legislation be enacted to provide that the Division of Biological Control of University of California be put in charge of projects dealing with eradication or biological control of plant or animal pests with authority to contract or otherwise to delegate execution of the projects,

(3) that each control or eradication project be reviewed and money allocated for it by the Finance Committees of the Legislature before substantial work is done on the project.

CHAPTER XI

FROM A CROP SPRAYER'S RECORD BOOK

Crop sprayers must file records of their work with the county agricultural commissioners, so that we were able to examine a typical list of jobs from February 17 to March 9, 1974 in the Imperial Valley. This is a typical interior farming valley, supplying winter lettuce for the United States, producing hay for Los Angeles and San Diego Counties, and having a small town calling itself carrot capital of the world. Thus is underlined California's responsibility to consumers far and wide, and the right of

the public to scrutinize farmers' pesticide practices.

A traumatic fear of insect pests motivates these farmers because of massive spraying for pink bollworms a few years ago. These pests place themselves out of reach of pesticide by larvae feeding inside cotton bolls, pupae developing in soil, and adults becoming night–flying moths. This obstacle was exaggerated into hysterical over–spraying, perhaps increased because federal and state governments were paying the bill. When monitoring of pest population reduced spraying, the harm had been done: beneficial insects had been decimated, and spraying throughout the year prevented their return, so that treatment of all crops became routine like other chores. Needless to say, pesticide sales increased.

This crop sprayer's record book indicates that farmers made no effort to reduce pesticide use or to protect beneficial insects. There were 198 spray jobs with 101 on alfalfa, 51 on wheat, 20 on sugar beets, and others for miscellaneous crops. *Although a few farmers used insecticide on wheat, probably without real need, the majority applied 2,4–D, a weedkiller. An alert agricultural commissioner could have directed them to bring up their weeds with irrigation before planting and then to disc them into the soil. Unless conditions have changed since my own family farmed in the Imperial Valley, barley needs no spraying; yet two fields were treated with thimet and systox. By

* See appendix for the complete record.

spraying barley, farmers miss the opportunity to create an insectary on their own land. First aphids attack barley in such numbers that they seem to overwhelm the plants; then such beneficial insects as lady beetles and lacewings, rapidly destroy aphids, so that predators spread into other crops to reduce spraying. Meanwhile, the barley crop is excellent. Conservation of beneficial insects requires that use be made of every opportunity of this kind.

The influence of pesticide salesmen is evident, because some farmers have been induced to buy two or three pesticides at one time when one would kill all pests; for example, one farmer applied in one spraying meta–systox, phosdrin, and thimet to a beet field. This exploitation of customers might have been stopped by the agricultural commissioner's refusal of a permit. Under a new state law, pesticide advisors are raised to expert status by an examination, but as long as they are at the same time salesmen, conflict of interest remains.

Compared to the sugar industry of Hawaii, beet growers have made little effort to avoid pesticides. Although many used sulphur, a relatively innocuous pesticide for consumers, others used thimet, meta–systox, phosdrin, diazinon, and systox. If sulphur sufficed for some, an alert agricultural commissioner should determine whether it might meet the needs of all.

FARMERS HAVE REJECTED CHLORINATED HYDROCARBONS

Not one chlorinated hydrocarbon appears on this crop sprayer's list. Fear of soil poisoning and of condemnation of crops because of excessive residue has motivated farmers to avoid the DDT family. When litigation by the Environmental Defense Fund caused the eventual ban of DDT, farmers were uninterested, because they already had made their own decision. Instead, the furor on the subject came from manufacturers. A few farmers who continue to use these products learn by bitter experience that they are dangerous.

THESE FARMERS ARE IN TROUBLE

San Diego Union, April 5, 1975

2 CHARGED IN MARKETING TAINTED CROP

Two partners in a San Ysidro farm yesterday were charged with marketing spinach with excessive residue of Toxaphene, an insecticide–herbicide.

Jerry Gonzales Jr. and George Tachiki, partners in G–T Farms, 202 Tijuana St., San Ysidro, were charged with five counts of violations of the state Agricultural Code. City Atty. John Witt's office filed the criminal complaint against the two in Municipal Court.

Deputy City Atty. Dennis Avery of Witt's Consumer Fraud Unit, said a load of the spinach was delivered to Sea World Feb. 26, but the birds would not eat it. The state Department of Agriculture

harged in Marketing Tainted Crop (con't) . . . . .

notified and found 12 above the allowable of the chemical spray aphene.

The spinach was traced to the grower, Avery , and it was learned G–T Farms had sold crates of the spinach to supermarket chain. The inach was traced from chain's warehouse to ividual stores where all it was found still in the ates.

Avery said the 40 crates were condemned and the remainder of the spinach crop at the farm was plowed under.

The crop was harvested a few days after spraying when the growers should have waited at least a month before harvesting, Avery said.

Gonzales and Tachiki are scheduled for arraignment April 17.

FARMERS MIGHT HAVE AVOIDED PROBLEMS

Chlorinated hydrocarbons might have been banned by law in 1972 if the Clean Environment Act, submitted in an initiative to voters of California by People's Lobby, had been enacted. However, it was defeated by a media campaign filled with propaganda that mosquitoes would engulf the earth and similar nonsense, and this opportunity for reform was lost. It is a satisfaction to People's Lobby, however, that events now prove that the legislation was proper and scientifically correct.

DDT is dear to the hearts of manufacturers of pesticides, since more than any other pesticide,

it will disturb the ecology of the insect w
therefore, its use marks the beginning of a co
tely chemical agriculture. Long after it has b
applied, it remains to destroy the delicate ba
cial insects and to poison the soil. For a perio
at least two years, it will make change to a
drastic method of pest control difficult in a gr
Therefore, manufacturers are pressing for its re
to use, although the effort has no scientific jus
cation, but is entirely motivated by industry pr
This effort to legalize DDT is related to a driv
spray forests, and in this matter timber own
have shown themselves gullible. The experience
farmers should teach them that use of DDT will
the first step toward an everlasting spray prog
throughout forests, and as in all heavy spraying
programs, will increase pest problems. Farmers
now drawing back from this enterprise, have com
pleted an experience that timber owners are jus
beginning.

What of the tussock moth? This pest periodi
cally damages a few trees, and then recedes becaus
of natural enemies. When DDT was finally applied
the pest population was collapsing. Unfortunately
the court decision obtained by the Environmental
Defense Fund against DDT left the loophole that
it might be brought back for emergencies. Look
forward, then, to an increase in synthetic emergen
cies.

CHEMICAL TIME BOMBS

Soon after DDT and related chlorinated

registered, officials recognized their serious
effects. Wayland Hayes, Jr., M.D., Chief of
Toxicology Section, Technology Branch, Com-
cable Disease Center, Public Health Service,
nta, Georgia, and an official defender of these
cides, recites the problems of crop sprayers in
aria-control projects for United Nations. A
enty-year-old man worked with DDT for one
and with dieldrin for one year, then was hos-
alized for typhoid fever. After returning to
aying, he complained of weakness, headache,
nausea, and then suffered a fit. There was no
sonal or family history of convulsions. Other
es showed the same pattern: a period of seeming
munity followed by evidence of serious poison-
All these men were young and strong and pro-
ably wore protective clothing.[55]

By conducting experiments centering upon this
s period of seeming immunity, research scien-
ts may come to the conclusion that all is well, so
at a pesticide is registered, used for twenty or
ore years, while protests accumulate, and after
ngthy court action, finally withdrawn from use.
his refers not to a single mistake; it is common
rocedure.

Morton Biskind, M.D. comments: "A new prin-
iple of toxicology has, it seems, become firmly
ntrenched in the literature; no matter how lethal
a poison may be for all other forms of life, if it
doesn't kill human beings instantly, it is safe."[56]

"It is scientifically incorrect to assume that
poison may be handled indefinitely by organs

of excretion, such as liver and kidneys; in ... experiments numerous changes of liver and ... have been observed. Organs cannot endure ... deal, and one may look forward to ailments ... eloping in other parts of the body; for ... since the liver controls chlorestrol in the blood ... jury to the liver may cause this to become ... sive, so that heart disease or cerebral hemorrh... develops. If organs concerned with detoxifi... and excreting waste products of the body ... impaired, the body may become unusually ... tive; the word *allergic* describes this condition. Since DDT and related chemicals are fat soluble, the liver's part in digesting fat would make it especially vulnerable to chlorinated hydrocarbons.

"Malcolm M. Hargraves, M.D., formerly a practicing physician in the Mayo Clinic and professor of medicine in the Mayo Foundation, told the Ribicoff Committee that he asked his patients to review all contacts with poison and then to remove the poison," I wrote in 1966. "He gave the committee a number of case histories taken from his long experience.

"One patient had become anemic, her bone marrow showed a complete red cell dycrasia, and she had had twelve blood transfusions. Inquiry disclosed that a much frequented room had a lindane vaporizer, which heated the chlorinated hydrocarbon lindane, so that its fumes killed insects. She was cured when the lindane vaporizer was taken out, the room thoroughly scrubbed to remove residue, and the carpet cleaned.

"A Nebraska corn and hog farmer used both ... and herbicide on his farm. He developed ... leukemia and died." *

... when residues of DDT were generally ...ated over the world was consideration given ... dangers. Note the opinion of the President's ... Advisory Committee: "An important con... of several commonly used pesticides is ... persistence in the environment in toxic form. ...hemical half life of stable chlorinated hydro... in soils, and the time they remain active ... soil insects, are measured in years . . . .One ...these, dieldrin, resembles DDT in stability, per...nce, and solubility. Recently it has been found ... the fat of residents of southern England. It has ... been found in many wild birds, fish, and mam...s in the United States." 57

PESTICIDES FUMING FROM THE FIELD

In the crop sprayer's record book, pesticides ...t fume from the field predominate, the organo...sphates and the carbamates. Seemingly farmers ... seeking pesticides that leave no residue, and ...hosdrin has been reputed to disappear in a few ...urs. Applied in the evening, reportedly it will be ...ne before the next morning.

* From *The Pesticide Jungle* by Laura Tallian.

EXPLANATION OF A CROP SPRAYER'S RECORD BOOK

	Pesticide	LD50 *
Organophosphates	phosdrin	3.7
	Di–Syston	12
	malathion	1150
	diazinon	466
	thimet	3.7
	systox	1.7
	meta–systox	40
Carbamates	Furadan	8
	Lannate	20
Weedkiller	IPC	1000
	2,4–D	

Have farmers solved their problems by dis- ing chlorinated hydrocarbons and substitu- other pesticides? Not at all. Never can a solu- be found as long as highly toxic pesticides are u in massive quantities, but by this change the eff has been made to shift the burden of disaster applicators and workmen in the fields, those wh handle the pesticides. There are about forty ganophosphates and a number of carbamates whi fume from the fields; therefore, let us beware

* LD50—lethal dose killing 50 per cent of test anima usually rats. It is measured in milligrams per kilogra of body weight; therefore, the smaller the number t more toxic the material.

blowing from a freshly sprayed field. When very volatile phosdrin is used, flagmen, stand- below the planes to guide pilots, look like the king dead. Though they are supposed to dress spacemen, protective clothing is difficult to ure in the summer heat of California's inland leys. What use of volatile pesticides does to air ality can be guessed.

Farm workers have two hazards from these ming pesticides: they live near sprayed fields, enter fields to handle produce soon after treat- ent with pesticides. For example, in Visalia, alifornia, fifteen men were overcome with para- hion poisoning on June 13, 1975, in spite of the act that they had waited more than the required entry period. This recent story is drearily repeti- ous of numerous injuries during the long use of his still popular pesticide.

Although reentry periods have been calculated arefully, they do not always protect workers. Both organophosphates and carbamates are choli- esterase inhibitors; this means that they reduce the amount of cholinesterase in the blood so that muscles do not relax. Insufficient cholinesterase causes muscles to go into spasm as if spastic, and movements are uncoordinated or rigidity results. However, the individual does not feel loss of cho- linesterase, so that he feels a false confidence, until suddenly he suffers massive symptoms–nausea, difficulty in breathing, blurred vision, convul- sions–and if the exposure is severe, death. Repea- ted exposure to these cholinesterase inhibitors, then, makes farm workers especially susceptible;

therefore, much of their protest centers upon safety from pesticide poisoning. That handlers of pesticides should be regarded as expendable indicates lack of morality in the risk/benefit analysis, written of prestigious environmental impact reports sometimes always place themselves on the benefit side of the ledger. Insurance companies, however, consider the factor of individual differences, because long ago they demanded regular checking of pilots for cholinesterase level, lest these men might be suddenly overcome and crash a plane.

When one considers that temperatures in California's inland valleys reach 115 degrees F. in summer, the influence of heat on these pesticides is alarming. A fire in a warehouse in Calipatria, California, where pesticides of this character were stored, recently caused the evacuation of the town of 2,000 because of lethal fumes. A truck loaded with Lannate, a carbamate, collided with another vehicle on a Los Angeles freeway recently, and caught fire. Firemen, pouring water on the flames, were overcome and taken to a hospital.

"Officials who condoned use of parathion were not making an honest mistake. They understood its lethal character," I wrote in 1966. "Griffith F. Quimby, M.D., Public Health Service, Wenatchee, Washington, and Allen B. Lemmon, then second in authority to the California Director of Agriculture, in 1958 summarized what was known of the effect of parathion upon workers. They have analyzed eleven incidents of poisoning involving seventy persons working upon farms producing pears, apples, citrus fruit, and hops. Though parathion

residue declines sharply after a few days, it is becoming how long it persists upon leaves and fruit: fifteen cases of poisoning occurred 33 days after parathion had been applied." *

What of the disappearance of these chemicals? Much has been made of the fact that the original material cannot be found: it sinks into plants and runs in sap to kill insects as a systemic insecticide, but metabolites have been formed. Almost all these pesticides have this quality in varying degrees, but the most common systemic insecticides are systox, meta–systox, and Di–Syston. With the residue inside the plant, parathion becomes paraoxon, malathion changes into malaoxon, and carbamates indicate instability by breaking into various other forms. This chemical change, however, bodes ill rather than good, because highly toxic materials result. However, this disappearance has permitted much scientific malingering, since some scientists and officials have stressed the vanishing of the original and failed to mention the toxicity of metabolites.

The absorbent quality of these pesticides constitutes a danger: they should not be breathed lest they enter the body through the lungs, and a small amount of the most toxic on the skin of victims will cause death. Also, housewives cannot wash systemic pesticides off vegetables. Therefore, those entrusted with public health should view these pesticides with alarm.

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* The *Pesticide Jungle* by Laura Tallian.

Nor should anyone be impressed by the tolerances for pesticides set by the federal Food and Drug Administration or the Environmental Protection Agency. Rationing of poison by a neat calculation of what the human body can endure seems an extraordinary activity of government. Tolerances are always based on an average; this establishes the principle that anyone varying from the norm does not have right of survival. Since that norm is the LD50 of healthy rats, it is difficult to transpose the experience to apply to the human race or to the infants, the elderly, or the ill, for these deviate too far from the average. Nor can one be sure that the research is objective. If FDA or EPA accepts research of companies applying for registration of the pesticides in question, as has been reported, these manufacturers would be tempted to take a very optimistic view of risk.

Furthermore, recent research has indicated that the farmers' search for pesticides that will not poison soil has not been successful. Somehow too much optimism and too little scientific research seem to dominate registration of each new pesticide, so that scientists proceed on assumptions which are later disproved, as illustrated by soil poisoning. Dr. Homer R. Wolfe, Chief of the EPA Research Station at Wenatchee, Washington, has assembled facts in 1972 to prove that parathion lingers for a lengthy period in soil, especially in areas of spillage: he cites a near fatal poisoning of a child that ingested soil from a driveway where spillage had occurred six months previously. He states that spillage areas retain dangerous levels of

poison which would be hazardous to children and animals for as long as five years. Under ordinary use he finds that parathion sterilizes the soil temporarily of microorganisms effective in breaking down parathion.[58]

When human beings use poison against insects, they are striking at a form of life more accustomed to hardship than their own. Insects show resistance to poison in a variety of ways: some protect themselves by a less permeable outer covering, by storage in fatty tissues, by efficient excretion, or by changing the poison to something less toxic by enzymatic action. Primarily they triumph by sheer reproductive power; the rapidity with which generations follow one another makes possible adjustments unknown to mammals; for example, some aphids will have a new generation every ten days. In this matter, mankind is in a collision course with nature, and it seems evident in the frenzied search for new chemicals that mankind will not be the winner unless he changes his ways.

CHAPTER XIII

ALFALFA, BATTLEFIELD FOR PETROCHEMICAL AGRICULTURE

These pages from a crop sprayer's record book show how spring comes to California's agricultural valleys, not with the sweetness of flowers but with

fuming of organophosphate and carbamate pesti-
des rising from the fields. Acre treatments reach
fifteen million in 1970 for California farms.
With airplane application of pesticides to almost
every crop, drift becomes a factor, so that farmers
have difficulty in guaranteeing safety of their pro-
ducts, shipped to every part of the United States
and to world markets. Yet the pesticide trade con-
stantly registers new products and tempts farmers
into new uses; therefore, periodic scandals rise.
The latest reported June 24, 1975 centers upon
255,000 boxes of lemons, grapefruit, and oranges
which Japanese officials have refused to allow un-
loading or even dumping into the ocean since the
fruit has been treated with two fungicides. *Ortho-
phenyl--thenol* (OPP--tolerance 10 ppm) and *Thia-
bendazole* (TBZ--tolerance 2 ppm) were applied
after harvest to prevent mold, and the Japanese
have banned both chemicals. The United States is
now petitioning Japan to relax its standards. Loss
of this market will cost growers $40 to $50 million
annually. 60

The names of Shell and Chevron in pesticide
manufacture suggest the connection between oil
and pesticides and the manner in which waste
products so poisonous that they pose problems of
disposal can be made into profitable sales items
simply by incorporating them into food produc-
tion. They also indicate the political pressure that
officials at all levels of government must learn to
withstand.

Contrary to propaganda, a petrochemical agri-
culture is endangering food production: since

pesticides have reduced bee population, farmers are
having difficulty in securing pollination for fruit
and seed crops, and bee rental is becoming more
costly. The long range problem of what will hap-
pen to soil with its teeming microbial and insect
population is shrugged aside, although many scien-
tists are asserting that problems sometimes ascribed
to insects may result from improper care of the
soil. Nor are pests properly controlled: in spite of
the deluge of poison, an increasing number of pests
are resistant to certain pesticides, and some to all
that can be brought against them. 61

Since a change must come, People's Lobby has
tried to determine what policies of the Department
of Food and Agriculture will delay or will assist
reform.

Alfalfa will be the battlefield upon which is-
sues of a petrochemical agriculture will be decided.
It is vital to the ecology of a farming area as a
perennial crop, within whose shelter a normal and
balanced insect life develops and spreads to other
crops, to reduce need for spraying. It serves as in-
sectary for other crops, conserving beneficial in-
sects throughout the year. There is no other crop
so widely cultivated to act as refuge. Therefore,
those benefiting from heavy spraying, such as
manufacturers of pesticides, crop sprayers, or pesti-
cide salesmen will seek to increase pesticide treat-
ment of this crop, and those opposed to such
practices will attempt to make it an unsprayed
crop.

The decision of the Department of Food and
Agriculture that biological control of insect pests

should be financed by the affected agricultural industries conforms to the profit motivation of those desiring heavy spraying, not only of alfalfa but of all other crops. It constitutes support not of the farmer or the consumer but of the pesticide industry. It promotes pesticide use, a thesis to be developed.

Emphasis upon eradication of insect pests gives that activity the major share of public financing, and makes scientists in the Division of Biological Control dependent upon charity for all specific projects. Instead of devoting themselves to scientific research, they must hustle grants, an activity for which they are unsuited; they are gentle, thoughtful men, not of the marketplace. Obviously in this competition for grants, pesticide companies are more generous donors than farmers, to whom those desiring biological control must turn. Financing by farmers is intermittent and inadequate, and a program for control of an insect pest must have long range financing. If a parasite or predator is brought from Europe or Asia, it must be put in quarantine until its potentiality can be assessed, reared in a laboratory to produce sufficient numbers, then colonized in several areas. Additional insectary population must reinforce the first insects liberated, and finally there must be evaluation of results. Perhaps additional natural enemies must be imported, and success of control evaluated and problems corrected as pests and natural enemies spread throughout the state. While such importation of natural enemies is not so expensive as attempted eradication of insect pests,entomologists

must know where money is available before meaningful plans can be made. Instead, the Department of Food and Agriculture has chosen to turn these scientists into beggars soliciting private grants, and has advocated this plan to the Finance Committees of the Legislature.

Farmers deplore their spraying bills and would change if they could, but the Department of Food and Agriculture combines with pesticide salesmen to mount a fear campaign against insect pests. With this background farmers are not likely to contribute to research in biological control. As affairs go at present, they continue with pesticides to produce alfalfa; therefore, they risk no change, especially since the Department of Food and Agriculture will tell them with patronizing arrogance that biological control projects seldom succeed.

Another failure of the Department of Food and Agriculture centers upon the fact that officials do not protect research of the Division of Biological Control from pesticides. Pesticides and beneficial insects do not mix, and an eradication project should not overlay a project in biological control, as was done with whitefly eradication.

Sufficient money should be provided for entomologists working with biological control to rent release sites, so that they control them completely. The present practice is to make them again dependent upon charity so that they must give their precious insects to farmers, who promise to protect them and then fail to keep their promise. Farmers should not be asked for this cooperation, for, until a sufficient population of beneficial insects

develops, they face economic loss from the pest; this is a public cost and should not be borne by an individual.

Some of the problems during his work with the spotted aphid that should be met sympathetically by the Department of Food and Agriculture are described by Dr. Robert van den Bosch. There are certain problems that cannot be avoided, and strangely this includes keeping a proper number of pests, so that parasites can develop properly. Dr. van den Bosch notes that lady beetles frequently prey so heavily upon spotted aphids as to compete with parasites, so that there is a violent fluctuation in numbers. However, the real threat to scientists practicing biological control is failure of other people to cooperate with them; for example, without control of fields where parasites are released, they must watch these valuable insects destroyed by frequent mowing of alfalfa and chemical treatment of fields by growers. After a year of colonization efforts and the introduction of three kinds of parasites from the Middle East, it seemed clear that the project would fail. However, an alfalfa grower offered Dr. van den Bosch complete control of a 38–acre field and the assurance that he would not apply insecticide to any part of it. He set aside a five–acre plot in which any type of manipulation or cultural practices might be used to facilitate survival of pest and natural enemy. Within the five–acre section Dr. van den Bosch established a parasite release plot of approximately one acre, which was to be left uncut during the entire experimental period. The remaining part of

the five acres was to be used as a parasite "nursery" to assist the spread of the parasites beyond the one–acre plot. This was to be accomplished by staggered cutting of alfalfa, so that aphids and parasites would always be assured of protection from sun, which destroys much insect life. 61

All that was needed for success of this biological control project was complete control of release sites by these scientists. By the end of the summer parasites of the spotted aphid had spread over the 38–acre field and into neighboring fields, and from this field alfalfa hay covered with the parasitized bodies of aphids was taken to other areas in California.

I was permitted to have a small part in the colonization of parasites of the spotted aphid in the Imperial Valley. The same problem was troubling entomologists: farmers were spraying the valuable parasites, brought with such expense and trouble from the Middle East. I donated twenty acres of land to the project and had the pleasure of watching establishment of the parasites and the end of chemical treatment for spotted aphids. The most anxious moments were those in which it seemed that aphid population would decline so drastically because of a fungus disease of aphids that parasites might not have sufficient food. Indeed, Dr. van den Bosch reported that he built a cage around the original release site to protect aphids from lady beetles. The Imperial Valley field was strip–cut to protect insect life, and Everett Dietrick, working with Dr. van den Bosch, built a huge vacuum cleaner and mounted it on a pickup,

to vacuum the field twice for parasites that farmers might carry into their own fields.

These facts are recited at length in order to show the vital need that entomologists have release sites under their control, since the practices described do not conform to ordinary farming practices.

Biological control of spotted aphids was triumphantly successful, so that alfalfa became an unsprayed crop. Shipments of lady beetles controlled occasional outbreaks of pea aphids, and no other pest was important.

THE ALFALFA WEEVIL

To understand the problems of casuistry centering upon alfalfa, one must use inverted logic. When spotted aphids devastated alfalfa throughout the state, cash registers rang up millions in sales to the pesticide trade, but when beneficial insects did the work of pesticides, sales dwindled to zero. For this industry tiny wasps laying their eggs in the bodies of aphids were competitors and enemies to be destroyed. The arrival of alfalfa weevils provided an opportunity to mount a war against beneficial insects. The pesticide industry in 1975 chose Furadan, a highly toxic carbamate, and phosdrin, a deadly organophosphate. Alfalfa weevils appeared in February and March, and if all beneficial insects could be destroyed by early spraying, the population would not be restored in time to protect against spotted aphids, and further spraying for that pest would be in order. On the other hand, if less harmful pesticides were used, parasites of

spotted aphids would protect that crop. Alfalfa weevils have only a single generation, and therefore need only a single spraying. The Department of Food and Agriculture had power to direct this choice of pesticides through the permit system administered by agricultural commissioners, but viewed the matter with indifference and let industry have its way. Industry, manipulating events, created a shortage of the less harmful pesticides. Constantly these dramas centering upon profit take place, and if one knows the true meaning, he can evaluate motives and know the hearts of men.

In obedience to the policy that public funds should be spent for eradication and private funds should finance biological control, the Department of Food and Agriculture neglected the alfalfa weevil problem.

"During Reagan's era our budget was chopped about 20 per cent, and inflation has made further horrendous inroads, especially in the last year," Dr. van den Bosch wrote on January 7, 1975. "Yet everyone is screaming for biological and integrated control. And now that the prices of pesticides are skyrocketing and some materials in short supply, there is even greater pressure on us to develop alternatives.

"The Egyptian alfalfa weevil problem is a case in point. The pest is really devastating. I would estimate that it cost the alfalfa industry $15 million last year, and it has not reached its full impact. Now the livestock people are being hit, because the weevil is ripping up bur clover in wild pastures. Bur clover is the key species in lowland California

rangelands, being a high protein source, and soil fertility builder (a nitrogen fixer). It is knocked out of the rangelands, and replaced undesirable species. Needless to say, the cattle and sheepmen are going out of their minds. can't spray (too costly), and they can't expect rapid development of resistant varieties. And, if the latter were developed, it would be years fore they could re-populate the pasturelands.

"Meanwhile, in alfalfa there is a tremendous amount of insecticide spraying at the worst possible time of the year (first cutting). Not only there drift to other crops and properties, but the spraying causes secondary pest outbreaks (aphids, spider mites, caterpillars) in alfalfa itself, which lead to further spraying (the insecticide treadmill).

"So we have a multiple problem—the worst insect problem in California today. Yet I can't get any support for my biological control program. Christiansen turned me down (while in the meantime blowing hundreds of thousands on eradication and 'control' programs), the alfalfa industry is completely unorganized, and has not come up with one thin dime. The cattlemen have passed resolutions asking for support, and woolgrowers have given $150. They are the poorest of the lot, and at least have given something." 62

The technical problems in biological control of alfalfa weevil can be solved by the Division of Biological Control. Dr. van den Bosch and Dr. P.S. Messenger have summarized them. There are two related pests, the alfalfa weevil and the Egyptian alfalfa weevil. The alfalfa weevil came first to

and was controlled by a parasite *Bathyplectes curculionis*. However, when the alfalfa weevil spread throughout California, the parasite did not succeed in the hot interior valleys, but gave better performance in the mild coastal valleys of central California. A strange reaction called encapsulation developed, whereby the pest surrounds the parasite egg or larva in its body with blood cells and causes death to the invading organism. Therefore, parasites are present in all localities but are not equally effective. Meanwhile, the Egyptian alfalfa weevil, a more troublesome pest, has entered California.

There are many places where additional parasites may be sought, for these weevils are dispersed over an area of eight to ten million square miles in Europe, Africa, and the Middle East. Since the usual solution to such problems is to seek natural enemies in similar climates, Dr. Messenger and Dr. van den Bosch suggest Iraq, where the parasite has been observed attacking weevils. 63 All this is not a permanent obstacle, but an unfinished problem. That this pest has created such havoc in the state is due directly to failure to grant proper funding to these scientists who will be able to solve the problem.

As if alfalfa weevils were not enough, a new aphid, *Acyrthosiphon loti,* has come from Europe and is now distributed from Imperial Valley to Sacramento. If the alfalfa weevil problem had been solved in its proper time, this aphid might not have presented a serious problem. Many aphids come for an interval and then recede with hot weather, or are readily conquered by such aphid enemies as

lady beetles or lacewings. However, heavy spraying for weevils puts the farmer on the insecticide treadmill with all beneficial insects slain, so that it will be difficult to assess the impact of the new parasites. This is a situation that makes farmers go bankrupt and causes cash registers to ring for all who deal in pesticide sales. That farmers must deal with the unsolved insect problems results from the policy of the Department of Food and Agriculture that any dication should have massive funding from public money, but that biological control should have nothing. Even routine expenditure for the Division of Biological Control is meager: at Berkeley $371,000 and at Riverside $528,808 for the fiscal year 1974–1975. This money must be spent for salaries and other necessities with only a minor amount for special projects. Any major problem must be financed by grants. Mandatory instructions in the Agriculture Code require the Director to reduce use of pesticides, but by neglect of biological control and limited funding for those who understand it, he is handing a bonanza worth millions to the oil–pesticide complex that seemingly dominates this department.

Late news comes that Dr. van den Bosch has gone to the Middle East and to Asia to search for parasites of the Egyptian alfalfa weevil, the codling moth, and aphids.

Dr. van den Bosch reports optimistically about the success of his search for beneficial insects in a letter dated June 1, 1975. "I am over here trying to do some good for the California environment, and I think that I have come up with some likely

parasites to help counter the insecticide blanket.

"Several months ago I told you that I was worried about the alfalfa weevil project and its funding," Dr. van den Bosch continues. "This concern derived from the fact that the heaviest extramural support was coming from a National Science Foundation grant, and that future funding from this source was very tenuous. It appears that my apprehensions are about to be realized. National Science Foundation wants to shift the support burden for biological control to the United States Department of Agriculture (grant funds), and the USDA tentatively agreed to this. But then it changed its mind. Now National Science Foundation says that it will not support the alfalfa weevil biological control work beyond this fiscal year. That's its prerogative, and I can do nothing about it. I have been working with the cattlemen's association for a five-year support package, but that is still in gestation, and there are some hurdles.

"The California Department of Food and Agriculture says that it can't help because this is not a newly invading pest. Mr. Christiansen once showed interest in awarding a small contract (several thousand dollars), but that collapsed in a cloud of bureaucratic dust.

"My current exploration is being supported about 60 percent by funds provided by the Walnut Marketing Board, 20 per cent from the Division of Biological Control funds, and another 20 per cent from the National Science Foundation grant funds. Therefore, I am working on about a half dozen pest insects, one of which is the alfalfa weevil." 64

CHAPTER XIII

AGRICULTURE MUST HAVE BEES

Since bees pollinate fruit and seed crops, a numerous bee population is necessary for successful farming and an abundant food supply. Since pesticides kill bees, their use is a danger to agriculture.

"About ninety commercial crops are pollinated by bees in the United States. Some are directly dependent upon bees for economic production such as apples, pears, cherries, blueberries, cranberries, and most commercial fruits, cucumbers, squash and other vine crops, clovers and other forage crops grown for seed, and seed production of such diverse crops as carrot, onion, sunflower, buckwheat, radish, mustard, cabbage, celery, asparagus, garden flowers, and many others," the E.C. Martin of the Department of Entomology of Michigan State University reports. "Many wild plants which provide seed, fruit, and forage for wild life depend upon bee pollination." 65

Because of a petrochemical agriculture, beekeepers are constantly in flight, moving their bees to escape one spraying or another. Even with all this effort, about half a million colonies are destroyed or damaged each year in the United States. Under constant threat from new and more toxic pesticides, beekeepers watch the number of their colonies decrease as pollination needs are rising.

E. MacGregor of the United States Department of Agriculture cites these figures: "We have than five million colonies of honey bees. Perhalf of these are in the 1 to 50–colony ownerclass (strictly amateurs) whose owners are in ly equipped to move them to specific crops pollination purposes. About half the remainder million) might be classed as migratory, alh the moves are from one nectar flow to ano- with little or no usage of the bees as pollina- This leaves only about 1.25 million colonies might be available at some time during the for pollination. These are probably used on verage of two crops per year.

"Is this supply sufficient to meet the potendemand? Definitely not! There is a need for to possibly twenty times the number of mobcolonies that are presently available, or 2.5 lion to 10 million mobile colonies." 66 Mobcolonies mean colonies owned by beekeepers o have large trucks with mechanical loaders, o are accustomed to moving long distances, d who are willing to sacrifice honey production pollination rental. In the 1930's pollination as free as sunshine, but now rental for bee lonies has risen to $6.00 to $10.00 per colony, d beekeepers are demanding security from peside destruction before they rent colonies.

Development of hybrid seed has increased e need for pollination; for example, soybeans rmerly did not require bee pollination, but ybrid seed of this plant cannot develop without es, since bees must transplant pollen to the

male–sterile plant. If approximately half a [illegible] acres of soybeans are planted, this will [illegible] more than a million colonies of bees. Cotton [illegible] plant which may be produced without bees. [illegible] bees increase the quantity of seed and lint, hy[illegible] cotton may increase the need for bees.

The crops that require cross pollination [illegible] be produced without bees. 20,000 acres of [illegible] monds are produced in California, and the flo[illegible] must be cross pollinated with pollen from tree[illegible] another variety. Apple production presents [illegible] same problem.

Without bees little alfalfa seed will be pro[illegible] ed; therefore, it is essential that a program be [illegible] vised to keep bees safe as they pollinate this [illegible]

If there were no other compelling reason, [illegible] great need of agriculture for bees would be suf[illegible] cient to force development of an integrated spr[illegible] program, which can be developed into biologi[illegible] control.

CHAPTER XV

INTEGRATED PEST CONTROL, A PROPOSAL FOR SURVIVAL

The lesson learned in Peru by cotton farmers [illegible] the Canete Valley has meaning for California fa[illegible] mers. There it was proved that pests survive bett[illegible] than the soil microorganisms that promote so[illegible]

[illegible]y or the beneficial insects that lower far[illegible] pesticide bills. The Canete Valley is one of [illegible] forty coastal valleys separated by severe de[illegible] and watered intermittently by rivers. Farmers [illegible] duplicated the history of California by chang[illegible] the chlorinated hydrocarbons with heavy use [illegible]nzene hexachloride and DDT. Then they [illegible]doned these for the organophosphates. At first [illegible] were high with 648 pounds of cotton per [illegible] in 1954, and farmers developed the idea that [illegible]ore pesticides used the better.

Dr. R.L. Doutt and Dr. Ray F. Smith of Uni[illegible]ty of California describe the gradual reduction [illegible]ields, which was accompanied by increasing [illegible]icide costs, so that presently cotton could not [illegible]grown on any land except the best. Leafworms [illegible] other cotton pests developed resistance, there [illegible] pest resurgence, and secondary pests freed of [illegible]ural enemies assumed serious pest status. Whe[illegible]r California has reached this condition should [illegible] a matter of inquiry, but interviews with some [illegible]mers have indicated that this is happening here.

In Peru the 1955–1956 seasons were economic [illegible]asters: pests resistant to pesticides were out of [illegible]ntrol in the cotton fields, so that millions of [illegible]les were lost. Yields dropped to 296 pounds per [illegible]re.

Integrated pest control was adopted; sec[illegible]d-year cotton was prohibited, the Canete Val[illegible]y was re–populated with beneficial insects from [illegible]her valleys, and these insects were protected in [illegible]very possible way. The synthetic organic com[illegible]ounds were used only by special permission of a

commission, a system similar to the Calif
method of requiring permits from agricul
commissioners. The insecticides used were nic
sulphate and arsenicals. [67] The arsenicals we
not recommend, because this would bring C
ornia back to the problems of the early 19
when calcium arsenate poisoned California f
to the detriment of cattle and unlucky consum
However, these pesticides are less damaging
beneficial insects, and cotton production incre
to 644 and finally to 922 pounds per acre as p
problems receded. Since pests and pest proble
are quite different in California, it does not follo
that the same pesticides must be used under
tegrated pest control.

How can integrated pest control be applied
California? It uses a multiplicity of techniques
cultural methods, resistant crop varieties, ste
insects, attractants, augmentation of parasites a
predators (the living insecticide), and finally th
pesticide least damaging to beneficial insect

An example of cultural methods is the inte
planting of alfalfa with cotton to keep lygus bug
in alfalfa, where they do little damage, and awa
from cotton, where they injure the bolls. Anothe
device is strip–cutting alfalfa, or the harvest o
hay in alternate strips, in order to protect from ex
posure to the sun insects developing in norma
balance. These tactics vary with crop and area
sometimes early planting permits a crop to matur
before a damaging population of some pest deve
ops, or, as with cotton, a cotton–free period i
winter and simultaneous planting on an agreed da

reduction in over--wintering pests.
Entomologists first establish an economic
shold for each crop; that is, the pest popula-
that each crop can endure wthout economic
to farmers. Dr. van den Bosch notes that obser-
of this economic threshold can reduce pesti-
use 50 per cent, especially for farmers who
routinely. [68] Workers with minimum train-
as field scouts determine whether economic
sholds are exceeded, and whether population
pests is increasing or receding under impact of
ural enemies. A professional crop protection
cialist directs them, and advises farmers not
in application of pesticides but in irrigation,
treatment, and all other matters that may re-
to increase of insects or plant diseases. An esti-
ate has been made by the United States Depart-
nt of Agriculture of the manpower required to
this plan into operation in the United States.*
te the figures for California: a total of 4,304
ld scouts and 287 professional crop protection
cialists. [69] There are already private companies
at perform this service in California, and without
ubt graduates of University of California special-
ng in biological control of pests could be recruit-
, although for complete services throughout the
ate, there should be a crash program of training
crop protection specialists. College boys with
rhaps a course in entomology could serve as field

* See appendix.

scouts with minimum instruction in pests
beneficial insects anticipated in the crop
at the time. People's Lobby believes that
would be far more useful employment than
gency detection of pests under Section 224
the Agriculture Code. Under this integrated
control program it is likely also that new
would be discovered while other pests were
ed. According to the Council of Environmental
Quality, each scout supervises from 1,000 to
acres, and collects data, which he reports to
supervisor.

The United States Department of Agriculture
initiated projects in 1971 in cotton in Arizona
the Southeastern states, and in tobacco in
and South Carolina. The Council on Environmental
Quality reports that the money saved from reduced
insecticide use more than compensated cost
field monitoring. The cost in the cotton program
of $1.00 to $1.50 per acre for field scouts reduced
the cost of spraying so that farmers were able
save more than $2.76 million on 220,000 acres.

Note Dr. van den Bosch's statement that, in
addition to cotton, integrated control programs
have been developed in alfalfa, apple, citrus, grape,
pear, oil palm, rubber, cocoa, and glasshouse
crops.[70]

"In each of these cases preservation and/or augmentation of natural enemies has been a critical
factor in the program," Dr. van den Bosch explains.
"Currently, many additional programs are under
development, and these, too, place major emphasis on the role of naturally occurring biological

control."

All this would demand an exciting expansion
of the Division of Biological Control, as these
scientists endeavored to expand the educational
program to pass on to others that precious technical knowledge essential not only to the survival
of agriculture but of the human race. Additional
crop protection specialists would require training,
as well as field scouts, research regarding pest problems and the search throughout the world for natural enemies of pests would continue, and eradication or biological control programs for new pests
would require planning and direction. Through all
this, an integrated pest control program would be
viewed only as a way station to biological control,
the elimination of harmful pesticides.

This would require additional funding, but in
the opinion of People's Lobby the money could be
found by curtailment of those programs centering
upon expanded chemical control of pests and massive eradication programs, so that in the long run
there would not be an additional charge upon the
state. In that connection the experience of the
Hawaiian Sugar Planters Association should be
reviewed.

CHAPTER XVI

THE PERMIT SYSTEM NEEDS REFORM

It has been widely stated that California has better laws than any other state for regulating pesticide use. People's Lobby agrees; however, administration decides the value of a law, and the heart of pesticide regulation is a well administered permit system. When permits are issued by agricultural commissioners for every job, this personal contact helps everyone: agricultural commissioners, finding a need to know the pesticide history of every area, keep in touch with farmers and learn where infestations of pests are appearing, or check farmers who are misled into unnecessary spraying. Conscientious commissioners, then, prevent farmers from making mistakes. Unfortunately, early in the history of the state permit system, the director interpreted permits as seasonal or annual, and thus spoiled the entire system. If a permit is issued for a lengthy period and periodic reports are made only after spraying has been completed, everything is after the fact. No injury can be anticipated and prevented, and the commissioner has no detailed knowledge of his county. He becomes merely custodian of paper work, accumulating in his office, and salesmen of pesticides become the real mentors of farmers. Nothing can persuade those who have watched pesticide sales increase that Directors of Food and Agriculture do not condone this state of

fairs.

To understand this, please review with me the story of the permit system in California. From 1917 to 1960, my family had a bee business in the Imperial Valley of California; therefore, I recall that beekeepers in 1938 secured an ordinance in that county to regulate pesticides, the first legislation of its kind in California. The issue was safety, not of human beings but of bees, killed at that time by pesticides applied to melon blossoms. Dr. J.E. Eckert of University of California suggested that bees did not work cantaloupe blossoms from four in the afternoon to seven o'clock the next morning, and that pesticide might be applied safely during those hours. Beekeepers, themselves, discovered that bees did not visit squash blossoms after one o'clock in the afternoon. In humid climates the hours might be different, but this was correct in dry desert air. A county ordinance was adopted by the Imperial County Board of Supervisors at the request of the late B.A. Harrigan, agricultural commissioner at that time, to restrict spraying to those hours when bees did not visit blossoms of treated crops. This timing protected bees for many a year, and permitted beekeepers to keep bees close to sprayed fields, not only of melons but numerous other crops.

This was as important to melon growers as to beekeepers, since all gourd plants need bees for pollination. These plants are totally dependent upon insects, because there are male and female blossoms entirely separate but growing on the same plant. Insects, covered with pollen, must move

from blossom to blossom, and of all pollinat bees are best: their bodies are covered with hairs which hold pollen, and their habit of wor the same kind of flower until the honey flow that plant fails ensures distribution of proper len. Melon growers at this time desired bees their fields, because without them they produc luxuriant vines but no melons.

Needless to say, this agricultural commissio interpreted the law to mean job permits, issu each time that a sprayer treated a field. This perm might be secured merely by a telephone call, that the duty was not onerous. However, the le islation brought peace to producers with seri problems, and some of its benefits were transferr to other farmers or to consumers. Farmers, apply ing calcium arsenate, the insecticide used during this period, were often restrained from applying it where it might drift to hay fields, and thus cattle were protected. The records that the permit system generated and personal contact with farmers made the commissioner aware of what pesticides had been used on particular crops, so that he could stop dangerously contaminated shipments before they reached supermarkets. While injury could not be completely prevented when highly toxic pesti cides were applied by airplane, damage was redu ced to a minimum by sincere and effective regula tion.

For this reason legislators modelled the state law after the Imperial Valley ordinance, but Dir ectors of Food and Agriculture erred in failing to carry over the concept of the job permit. If a great

al of paper work is done and little real control, as token regulation usually turns against those eding protection. For example, if at present a esticide is duly registered and a permit secured, e will assume that its use is contrary to public in- erest: the assumption is that the pesticide is guilt- ss, but that the victim is at fault, or that the pplicator is careless. Regulation, then, has become otection against genuine evaluation of the toxi- ity of the pesticide; for this reason it helps pesti- de manufacturers. If it were the purpose here, I ould enumerate many instances of good legisla- on perverted to become shield to offenders ther than benefit to the public.

To administer an effective permit system, the ommissioner occasionally must refuse permits, ut since granting of each permit depends upon ersonal discretion, this matter cannot be legisla- ed. Mr. Harrigan, desiring regulation to succeed, dealt out a stern justice, so that agriculture pros- ered. During this period, rental for bee pollina- ion was unknown: bees placed near the fields dis- ributed their services free as sunshine, and farmers had to study the matter before they were convin- ced even of the necessity of pollination, since the problem had never troubled them.

When a change is made to biological control on some crops or to an integrated spray program on others, the director must have a strong permit system in the counties. A permit system using annual or seasonal permits is utterly useless: farmers, having been trained by salesmen to ex- cessive spraying, will fear the new program and

will need reassurance from the commissioner. The agricultural commissioner must step forward as guide and mentor to educate farmers in a different and more reasonable system of pest control than the practices now in use. This can be accomplished only with the job permit.

CHAPTER XVII

RECOMMENDATIONS FOR AGRICULTURE

For the welfare of farmers and consumers of agricultural products, People's Lobby recommends the following:

1. that the director authorize and direct the Division of Biological Control of University of California to prepare plans for reducing use of pesticides on each crop of the state, beginning with major crops,
2. that regulations be drafted and hearings held to put these plans into operation,
3. that agricultural commissioners be instructed by the director to issue permits for application of pesticides to implement the plans developed by the Division of Biological Control,
4. that job permits for farmers and commercial applicators rather than seasonal or

annual permits be issued by agricultural commissioners, and that the regulations by the director be changed to make this mandatory, and
5. that the target date for putting this plan in operation be the spring of 1976.

THE DIRECTOR HAS A MANDATE TO CARRY OUT A REFORM PROGRAM

The director has a mandate to protect the public and the environment. Note Section 14102 of the Food and Agriculture Code:

14102. The director shall prohibit or regulate the use of environmentally harmful materials pursuant to the provisions of Chapter 2 (commencing with Section 12751) and Chapter 3 (commencing with Section 14001) of this division. In doing so, he shall consider the effect of all such materials upon the environment, and shall take whatever steps he deems necessary to protect the environment. He shall continue to initiate, cooperate, and collaborate with the University of California and with other state agencies in research to reduce and eliminate the use of environmentally harmful materials.

The director has two powers by which he can execute this mandate: (1) According to the Food

and Agriculture Code, Section 12781, he can adopt regulations, after hearings, which have the force of law. These regulations may control any aspect of agriculture–cultural methods, use of pesticides, or any other procedure of farmers–and they may be adjusted to apply in various ways to different areas in the state as problems differ. (2) Although agricultural commissioners issue permits for use of pesticides, they do so under direction of the director. Thus the director has dictatorial power to control the pesticide policy of the state and an enforcement personnel to carry out his decisions.

CHAPTER XVIII

HISTORY OF ENTOMOLOGY DEPARTMENT HAWAIIAN SUGAR PLANTERS ASSOCIATION

By Asher K. Ota
Experiment Station, HSPA

The Hawaiian sugar industry is world renowned for its pioneering efforts and successes in suppressing the insect pests of the sugarcane plant. All of the major sugarcane insect pests are presently under complete or substantial control by the introduction of natural enemies from other areas of the world. At the present time, no insecticides are used for the control of insect pests that attack the sugarcane plant. Where insect outbreaks periodically

occur, the planting of resistant varieties and special cultural practices are encouraged.

The success of biological control in Hawaiian sugarcane fields is often attributed to the following factors: (1) The flora and fauna of Hawaii is simple because it is an oceanic island. This increases the chances of successfully introducing and establishing a beneficial insect because there is less interspecies competition and also few natural enemies of the introduced beneficial species. (2) The climate is equable. (3) The economic damage level is high. The sugarcane plant is vigorous and can tolerate a lot of damage. Also, the end product is processed and the physical appearance of the stalk is unimportant as long as it yields sugar. (4) The sugarcane agroecosystem is very stable. Because of our cultural practices (2 year crop cycle and year-round harvesting), the sugarcane fields when taken as a whole remain constant. At any given moment, sugarcane plants are in various stages of growth and natural enemies are able to survive and follow pests into newly planted fields. With most other crops and in other areas of the world where sugarcane is grown, the entire crop is harvested in a short time, and this disruption of the habitat is detrimental to the natural enemies. (5) More effort has been made to control insects by the importation and establishment of natural enemies than in any other industry or area of the world.

Because of the early and subsequent successes in biological control, entomological research in Hawaii has emphasized the study of biological control. The State Department of Agriculture has

one man who is designated "Exploratory entomologist" and his job is to find and introduce natural enemies. A staff of about 15 men spend their time on rearing, releasing, and establishing new beneficial insects.

In Hawaii, whenever a new insect pest becomes established, we immediately ask, "Where is its native home?" And steps are taken for the importation of natural enemies. Our first and major line of defense is biological control through the importation and establishment of natural enemies. All other control methods are looked on as secondary or temporary unless eradication of the pest is possible.

Biological Control of Leaf Hopper

The history of biological control of sugarcane pests in Hawaii is filled with successes and on many of the projects, the entomologists had to overcome arduous trips and difficult obstacles. None of the projects, however, can illustrate and point out the principles of biological control better than the project on the sugarcane leaf hopper *Perkinsiella saccharicida*. The sugarcane leaf hopper became a pest in 1902 and by 1904 was causing extreme damage to sugarcane. At one plantation sugar yield was reduced from 18,000 tons in 1903 to 826 tons in 1906. Entomologists were, therefore, hired by the HSPA to solve this problem in 1904.

Although the leaf hopper was first found in 1900, its native home was not known until 1904. In 1903 several natural enemies of the leaf hopper

were introduced from the mainland United States but none were established. In 1904, it was determined that the leaf hopper was native to Australia, and Dr. R.C.L.Perkins and Albert Koebele went to Queensland to collect and introduce natural enemies. Several parasitic wasps that attacked leaf hopper eggs were found and brought back to Hawaii in 1904. In addition, Koebele went to Fiji and introduced another parasitic wasp in 1905. These beneficial wasps quickly became established and were spread to all plantations. By 1907, the leaf hopper population was under excellent control in most plantations.

However, in a few plantations where the rainfall was high, the leaf hopper remained a chronic problem. These tiny parasitic wasps were unable to control the leaf hopper in these rainy areas because the rain was detrimental to them, but not the leaf hoppers. Thus, in 1919, another expedition was sent to Queensland, Australia to search for other beneficial insects. After about a year, it was determined that many leaf hopper eggs were being killed by a little bug. This bug turned out to be the sugarcane leaf hopper egg–sucking bug, *Tytthus mundulus*. In 1920, this predator of leaf hopper eggs was introduced from Australia and additional introductions were also made from Fiji. By 1923 it had become so prevalent and effective that the leaf hopper was no longer a problem.

Other Sugarcane Insects

The initial success of the leaf hopper egg

parasites led to other expeditions for the purpose of introducing natural enemies of sugarcane pests (Table 1). Natural enemies were sought and introduced from North and South America, Australia, Fiji, New Guinea, Java, Japan, China, Malaysia, Indonesia, Philippines, and other countries to combat sugarcane pests. Many introductions were successful and many failed to establish. More important, however, is that all of the major insect pests are now under satisfactory control except for the New Guinea sugarcane weevil, *Rhabdoscelus obscurus*, which causes economic losses in certain regions. Even this weevil is under satisfactory control in 80 percent of our fields because of a tachinid fly parasite introduced from New Guinea in 1910.

Lessons from Biological Control Projects

From the leaf hopper project, as well as the other successes, we have learned a few lessons about biological control. (1) The importation of natural enemies from the native home of the pest or a closely related species is a sound and practicable method of controlling insect pests. (2) It may be necessary to introduce a number of natural enemies to control the pest in all areas and habitats in which the pest is found. (3) It may require many years of research and searching before the right natural enemy is found. For instance, the leaf hopper project took 16 years before it was completed. The control of the armyworm took even longer (1899–1942), some 43 years! (4) In some cases,

one single introduction can control the pest. Thus, each pest has its own biological properties and is unique. Biological control has to be taken on a case-by-case basis.

Other Studies and Accomplishments

Although HSPA entomologists were primarily involved with the biological control of sugarcane insects, they also introduced beneficial insects for the control of pests on other crops. These introductions were usually made in conjunction with their expeditions to other parts of the world for natural enemies of sugarcane insects. To some extent, this was because plantations in Hawaii were at one time involved in all aspects of community life since they operated villages for their employees and each plantation was an entity in itself. Entomological problems not directly related to sugarcane were discussed during their visits to the plantations. Some successes were achieved (Table 2).

Quarantine

From 1940 and during World War II, entomologists from HSPA played an active part in quarantine work at Midway, Wake and Guam and at Canton Island. The aim was to prevent the importations of insects from other Pacific islands into Hawaii.

Taxonomy

The entomologists were all taxonomists and

collected insects from the many countries they visited. Many of these insects were identified and a large collection of insects of the Pacific area was established. Also, in their travels throughout the Hawaiian sugar industry, efforts were made to collect many native insects in our mountains and other areas where native insects are found. These valuable collections are now deposited at the Bishop Museum and other museums of the world.

For many years the entomologists at HSPA were the center of entomological activities in Hawaii since they had the largest and most outstanding staff. Their dedication, determination, pioneering spirit, and scientific insight cannot be matched by any other group of entomologists working on a single crop. They did their job so well that most of the insect problems were solved permanently and the sugar industry no longer needs to maintain such a large staff of entomologists as it once did. Indeed, this is a rather rare phenomenon when one considers that at many institutions more entomologists have been working on the same problems for over 50 years. It can be said that they did their job so well that they worked themselves out of a job.

TABLE 1.

Hawaiian Sugarcane Insect Pests Under Biological Control

Pest Name	Degree of Control	Major Natural Enemy	Home of Natural Enemy
MAJOR INSECTS			
1. Sugarcane leaf hopper	C	*Tytthus mundulus*	Australia, Fiji (1920)
2. New Guinea Sugarcane weevil	S	*Lixophaga sphenophori*	New Guinea (1910)
3. Anomala beetle	C	*Campsomeris marginiella modesta*	Phillippines (1916)
4. Armyworms	C	Many species of wasps and flies	United States, Mexico (1890–1942)
MINOR INSECTS			
1. Chinese grasshopper	C	*Scelio pembertoni*	Malaysia (1930)
2. Sugarcane mealy bug	P	*Anagyrus saccharicola*	Philippines (1930)
3. Mole cricket	C	*Larra luzonensis*	Philippines (1916)
4. Sugarcane aphis	C	*Lysiphlebus testaceipes*	United States (1923)
5. Sugarcane leaf roller	S	*Microbracon omiodivorum*	Japan (1895)

TABLE 2

Biological Control of Other Insects in Which Entomologists From HSPA Have Played Important Role

1. Torpedo bug	C	egg parasite	Australia (1[illegible]
2. Coconut scale	C	lady beetle	Guam (1[illegible]
3. Fern weevil	S	larval parasite	Australia (1[illegible]
4. Black widow spider	S	egg parasite	California (1939)
5. Rice stem borer	P	3 species	Formosa, China Japan (1928)

*C = Complete: No longer a problem.
S = Substantial: Problem is sporadic, limited to 20% of acreage
P = Partial: Introduced natural enemies have reduced problem from former levels.

CHAPTER XIX

UNIVERSITY OF CALIFORNIA IS WORLD FAMOUS

In the world community of entomologists, the Division of Biological Control of University of California is preeminent. Only three other agencies in the United States bring insects from abroad--the Insect Identification and Parasite Introduction Branch of the Entomological Research Service of the United States Department of Agriculture, the Hawaii Department of Agriculture,

and the Hawaiian Sugar Planters Association.

From Albany (Berkeley) or Riverside, a project leader of University of California goes forth to search for beneficial insects. His scientific knowledge must be detailed and vast in scope, comprising all that can be known about insect behavior and biology--insects with males parasitic upon their own kind, hatching from infertile eggs, so that they have no male parents, or developing in the bodies of eggs of their victims. Some, like the egg parasites, are so tiny that they scarcely can be seen, or so rare that they may be overlooked. They are interrelated, possess strange food habits, or are susceptible to climate. Everything possible must be known about many pests and natural enemies, and all must be understood about the pest creating the problem and the related parasites and predators of this insect. Each of these men, then, becomes a specialist, working with citrus, or alfalfa, or other California crops.

First the invading pest must be identified and its homeland determined, for here will be the largest complex of natural enemies. For example, the citrus black scale had worldwide distribution, but was finally known to come from South Africa, where its most effective parasite was found. Often this preliminary identification is the key to the problem. In this world community of scientists, all share their expertise, so that sometimes the clue comes as a letter from some distant land.

Shipment is no longer a problem, for airmail has replaced slow ships, but each insect must be studied, so that it will have proper nutrients and

moisture, if shipped in the adult stage. Scientists try to mail it in an inactive stage–diapause, pupae or larvae developing within parasitized hosts.

Then the insects must go to a quarantine laboratory, which are few in number in the United States: three are operated by the United States Department of Agriculture at Moorestown, New Jersey, and Columbia, Missouri (natural enemies of insect pests), and Albany, California (natural enemies of weeds), three operated by University of California at Albany, Riverside, and Parlier, California, and one operated by Virginia Polytechnic Institute of Blackburg, Virginia (natural enemies of weeds), and one operated by the Hawaii Department of Agriculture in Honolulu.

The insects are kept in quarantine until diseases, if any, are determined, parasites are hatched from hosts, life history is studied, and if they destroy weeds, scientists can determine by starvation tests whether they are specific for the weed to be destroyed.

Then comes the problem of mass propagation, for usually the initial release must be supplemented. University of California developed a program of rearing pests on sprouting potatoes and banana squash, since a multiplication of pests must precede development of parasites or predators.

The University of California research scientists are stationed in the Divisions of Biological Control at Riverside and Albany, where they work with crop pests, forest insects, pests of man and animals, and weeds. They collaborate with the United States Department of Agriculture overseas facilities.

all phases of the project–procurement, propagation, colonization, and evaluation–are under control of the leader.

The first success was the importation from Australia of the Vedelia, a lady beetle with a tremendous appetite for cottony–cushion scale, which was devastating citrus. Albert Koebele, working for the United States Department of Agriculture, was the successful entomologist. Later he brought into the United States another lady beetle, an enemy of mealybugs. From this early beginning various beneficial insects have been imported, so that there is a very satisfactory complex of insects attacking citrus pests. Since the lady beetle brought to California by Koebele was sensitive to winter conditions, the idea was developed to propagate it artificially in insectaries and to release it in large numbers in infested groves. In Sacramento in 1913, Dr. Harry S. Smith, then employed in the gypsy moth parasite laboratory in Massachusetts, was appointed superintendent of the state insectary in Sacramento. He increased foreign exploration and set out on his first overseas mission to Japan and the Philippines to find enemies of the black scale. He also sent Dr. H.L.Viereck to search for further enemies of mealybugs in Southern Europe. In Sicily he found a small parasite that proved effective.

During the decade of 1910–1920, more than a dozen cases of establishment of natural enemies for control of pests occurred around the world. Six of these were either completely or substantially successful: the brown–tail moth, Canada;

the anomala beetle, Hawaii; the alfalfa weevil, Utah; the rhinoceros beetle, Mauritius; the sugarcane weevil, Hawaii; and the larch sawfly, Canada.

It was during this period that the technique of introducing natural enemies free of harmful organisms was perfected. In 1919 the United States Department of Agriculture created a laboratory in France as base for collection, rearing, and identification of enemies of the European corn borer, a major pest of corn in the United States. The natural enemies were reared to adult stage and shipped free of their hosts, any of their own natural enemies (hyperparasites), and all plant material containing other insect and disease pests.

In 1923 the biological control work in California was transferred to the University of California Experiment Station in Riverside, and Dr. Smith became leader there. In 1929 a new quarantine insectary was built there, and the one in Sacramento was shut down. Thus all responsibility for biological control investigation was given to the University of California, where it has reposed until the present time.

Dr. Smith not only dominated this work in California but became a world leader. During the decade of 1920–1930, more than thirty cases of natural enemy establishment were recorded. During this period, the woolly apple aphid parasite was transferred from its native New England to New Zealand, where it gave good control, and then to British Columbia, Chile, South Africa, Italy, Brazil, Uruguay, Australia, and other countries. The sugarcane leafhopper was controlled in Hawaii,

the citrus blackfly in Cuba, the citrophilus mealybug in California, and the greenhouse whitefly in Canada, among others. The decade 1930–1940 saw the peak of activity throughout the world with fifty-seven natural enemies established and at least thirty-two controlled successfully.

Then biological control declined not because it was ineffective but for other reasons. World War II disrupted the work of scientists, and more importantly the advent of DDT turned the world in the direction of petrochemicals for pest control and eradication. Of all pesticides, the chlorinated hydrocarbons (the DDT family) seem the most residual, so that a grove saturated for several years presents a problem for the owner desirous of changing to biological control. The road out seems to be use for an interval of a less toxic pesticide rather than immediate change. The new pesticides also presented to the farmer the mistaken idea of a world without insect pests, and in an effort to achieve this impossible goal, he entered what reputable entomologists have called the insecticide treadmill and brought upon himself the problems with which he now struggles. For scientists engaged in biological control, the emphasis upon the chemical control of pests meant less recognition of their efforts and less funding.

However, fortunately California was an exception to this rule. In 1945 a new biological control laboratory was opened at Albany, near Berkeley, and the University of California turned its attention to biological control of the Oriental fruit moth and Klamath weed.

Biological control of the Klamath weed was a triumphant success. Also known as St. Johnswort, a perennial native of Europe and Asia, it had invaded many parts of the world. It was first found near the Klamath River in northern California and spread over the rangeland of California, until by the mid 1940's it occupied more than two million acres. No only did it displace valuable native plants but was poisonous to livestock. Fortunately for those attempting biological control, the weed could not be controlled by chemical means, since it grew in inaccessible areas and had spread too widely, nor did owners of rangeland have the money to buy pesticides: therefore, there was no problem of beneficial insects sprayed out.

Two species of beetles had been sent to Australia from France, and from this Australian source specimens were secured for colonization in California. Within three years two of the leaf–beetle species *Chrysolina spp.* were successfully established. By artifical distribution of field–collected beetles the entire infested part of California had become colonized by 1950, and the beetle had spread to other western states. The problem was solved and required no further attention, a condition characteristic of a successful biological control project.

Other cases of biological control of weeds include alligator weed in Florida, puncture vine in some areas of California and Arizona, lantana on Hawaiian cattle ranges, prickly pear cacti on Santa Cruz Island off the coast of California, and tansy ragwort in northwestern California.

Dr. Carl Huffaker of University of California speaks with pride of the work of the university in biological control. He estimates that all biological control projects in California alone have resulted in $200 million savings from reduced need for chemical control and decreased pest damage in the last forty–five years. The environmental and sociological benefits as a result of diminished chemical pollution are obvious.

Nor should naturally occurring native insects be disregarded, since there is great diversity of insects throughout California; for example, 144 species of insects were found associated with the coyote brush, a type of California chaparral, and of these there were 54 species of plant–eating insects, 23 predators, 62 parasites, and five honeydew feeders. That these insects are in balance is indicated by the fact that plants in the wild lands grow without apparent damage. Sometimes an invading pest is substantially reduced in numbers by native California insects, and it is for this reason that spraying in desert areas, such as that mounted against the beet leafhopper, is damaging to the ecology of the insect world. This thought is introduced lest someone should believe that solutions of all pest problems lie in search abroad for natural enemies.

The preceding recital, summarized from the writings of Dr. Carl Huffaker, Dr. Paul DeBach, and Dr. Robert van den Bosch of University of California, is not intended as a history of biological control, but is introduced to show that this is a reputable science, and that scientists of the Division

of Biological Control of University of Cali... hold a responsible and distinguished position in ... world fellowship of entomologists.

CHAPTER XX

THE LETHAL HOME GARDEN

Home gardeners may kill themselves with pesti... cides sold freely over the counter People's Lobby charged in a press release of April 23, 1975, and called on Dr. Tim Wallace, Director of the Depart... ment of Food and Agriculture, to prepare a list of safe pesticides for household and home garden use and to warn the public of the dangerous chemicals now offered for sale.

"Officials of the state are charged with protect... ing the health of the public," reads the People's Lobby statement. "Instead, they seem more con... cerned with promoting sales of dangerous pesti... cides. The home gardener, compared to the farmer, has had little experience in use of pesticides; yet farmers must secure permits from the agricultural commissioner for these chemicals, and the home gardener uses them without instructions." *

* These are the regulations by which the director has freed the home gardener from all protection, and given him license to use the most dangerous pesticides

The Food and Agriculture Code, enacted by ... Legislature, has conferred upon the director ... right to draft the Administrative Code. Hear... are held upon the various parts of this code, ... unlike legislative hearings, the representative ... the department sits stony-faced, presiding but ...ming not to hear. There is never a response to ... people's testimony but the final regulation, ...hich has force of law. No dictator ever enjoyed ...eater power. People's Lobby postulates, however, ...at the director does not act entirely alone, but ...at the pesticide-oil companies lean across his ...oulder helping to draft the law. Otherwise, why ...ould he have freed the innocent and inexperienc... home gardener of all protection and at the same ...me offered him the most dangerous poisons?

EXTRACTS FROM THE CALIFORNIA ADMINISTRATIVE CODE

2463. Permits.

(a) Restricted materials specified in Section 2460 shall ... possessed or used only under permit of the agricultural ...ommissioner or under his direct supervision in any county ... which there is a commissioner, or under permit of the ...irector in any county in which there is no commissioner, ...xcept as follows:

(1) No permit shall be required for possession or use of the restricted materials specified below, including dust formations thereof, when possessed and used only for the following non-agricultural purposes in accordance with the registered label: home use, structural pest control, industrial use, institutional use, and uses by public agencies which have entered into and operate under a cooperative agreement with the Department of Health

Chloropicrin and methyl bromide, used to fumigate soil, must be applied by farmers only at a minimum depth of six inches and covered with a gas–confining tarp, buried under at least six inches of soil along the edges, according to the Administrative Code prepared by the director. People's Lobby cannot understand why these deadly materials are allowed for home sales.

Farmers are no longer using the chlorinated hydrocarbons. Why, then, are they listed for the home market? Even toxaphene, which resulted in legal action against the two San Ysidro farmers mentioned earlier in the book, appears on home garden recommendations. What can the backyard gardener know of residue?

pursuant to Section 2426 of the Health and Safety Code.

(A) Pesticides containing arsenic other than sodium arsenite as specified in Section 2460(a)(1)
(B) Pesticides containing cadmium
(C) Pesticides containing mercury
(D) Carbaryl (Sevin)
(E) Chloropicrin
(F) Methyl bromide
(G) Disulfoton (Di–Syston)
(H) Aldrin
(I) Benzene hexachloride (BHC)
(J) Chlordane
(K) Dieldrin
(L) Endosulfan (Thiodan)
(M) Heptachlor
(N) Lindane
(O) Strychnine (rodenticide uses only)
(P) Toxaphene
(Q) Zinc Phosphide

Promotion of a market for manufacturers is indicated by the inclusion of benzene hexachloride among home pesticides. This has been long avoided by farmers because a residue in the soil will cause a taste to be noticed in root vegetables grown the following year, a clear indication of soil poisoning. When I asked a nurseryman for this pesticide, he told me that he had not sold it for years. With these marketing problems, the manufacturer, then, needs home sales to increase his market.

Lindane is another chlorinated hydrocarbon much more toxic than DDT, but commonly used for dusting roses. Since successful court action by the Environmental Defense Fund caused banning of DDT, it would seem reasonable that other more toxic pesticides of the same nature should have been withdrawn from use. Their wilful addition to the home market is further affront to the consumer.

People's Lobby is shocked at the authorization of aldrin and dieldrin for home use, since

(R) Pesticides included in Section 2460(1)

(1) No permit shall be required to possess or use pesticides, included in Section 2460(1) which are registered for use in the form of a dust and packaged in containers holding 25 pounds or less, and for the use of such pesticides packaged in containers holding more than 25 pounds registered for and used in enclosed areas such as greenhouses.

(6) No permit shall be required to possess or use paraquat when possessed or used only for home use in accordance with the registered labeling.

registration of these pesticides has been suspended by EPA on account of their extreme toxicity. Although EPA has relented sufficiently to allow available supplies to be used up, it does not follow that they should be applied to home gardens in California.

Chlordane and heptachlor are pesticides found in every nursery and supermarket; yet EPA has indicted them for many dangers and suspended registration. State officials should read the indictment of these chemicals before releasing them to the home market. Although available supplies may be used up, according to EPA regulations, why subject home gardeners to these hazards? One does not find heptachlor on the list of pesticides preferred by farmers, even though it still may be applied legally under permit.

"A caged isomer more toxic to insects and fresh water animals than heptachlor has been shown to be formed on exposure of heptachlor to sunlight," states EPA. When heptachlor was first registered, its toxicity was evaluated according to the original material until it was discovered that heptachlor epoxide was twice as toxic, and that this new additional material was formed by sunlight.

When one explores long range effects, still more shocking data emerge. "Heptachlor and its metabolite, heptachlor epoxide, have been found to increase significantly the incidence of liver tumors including carcinomas in one strain of mouse at a single feeding level of 10 ppm," continues the EPA cancellation notice. "Subsequent analysis by

pathologists revealed a high incidence of carcinomas in animals from the experiment (greater than 5 per cent incidence in animals given heptachlor epoxide). . . .The tumors were found primarily in the endocrine organs, but a substantial number of liver tumors were found in the treated animals while no liver tumors developed in the control group." 71

"The cost of treating Americans for cancer will account for 4 per cent or 5 per cent of the nation's entire health budget this year," Dr. Sidney J. Cutler and Joseph Scott of the National Cancer Institute revealed.Dr.Cutler and Dr.Lester Breslow, Dean of the University of California at Los Angeles School of Public Health, estimated this to represent $4 to $5 billion of a total of $100 billion. It is estimated that 1.3 million people are hospitalized for cancer each year. 72

These cold figures do not measure the human suffering of cancer--the horror of discovery, the alternate hope and fear, the operation, and the bitter death--all multiplied into millions. As carcinogens increase in the environment, an increasing number of victims will meet death thus. Therefore, when officials explain that they will wait until the legal action against these pesticides has been completed, as one high official in the Department of Food and Agriculture told me, one feels shock at such lack of humanity. Carcinogens should not be wilfully added to the environment; in case of doubt the victim should be protected first, not corporations manufacturing the product.

Too late for San Diego people, whose beautiful

Balboa Park and lovely home gardens are saturated with chlordane, and too late for all the city dwellers who listened to pesticide salesmen, EPA announced today, July 30, 1975, that registration of chlordane and heptachlor has been suspended since they have been declared an imminent cancer hazard. Production and sale must stop because "residues are found in unborn babies, mothers' milk, and body tissues of most Americans."

Within the restrictions of law, Administrator Russell E. Train has taken the most aggressive possible method. He has avoided the eighteen months or more delay involved in cancellation procedures during which he estimates that 38 million pounds of the two chemicals would be manufactured and sold to enter the environment. However, stores will continue to sell available supplies until stocks are depleted; this again is a financial concession since the government would have to pay an indemnity if this permission were not granted.

Train said at a news conference that evidence of human exposure to chlordane begins in the womb and continues without interruption throughout life. He cited studies showing that residues were found in more than 97 per cent of the population; that they pass through the placenta into the human fetus, and that residues exist in up to 45 per cent of human milk samples.

Train was concerned with disposal of available supplies, and cautioned against dumping them down drains lest they contaminate water. If they are placed in land fills, there is the same ultimate problem. Indeed,this generation may be

remembered principally by its lethal garbage.

It is amazing that Di–Syston remains on the home gardener's list of pesticides when one considers the problem that it has caused farmers. One of the highly toxic organophosphates, it caused injury to cattle and sheep feeding upon alfalfa fields in the Imperial Valley, and the agricultural commissioner in Imperial County canceled all permits for its use on alfalfa and advised farmers not to market hay or forage animals on treated fields. [73]

It is shocking to compare the different status of cattle, which are commercial assets, to human beings, who are not. The director specifically has listed Di–Syston as one of the materials available without permit for home use.

Di–Syston has a high dermal toxicity; this means that a small amount splashed on the body is highly dangerous, so that it is difficult to handle. A plant so protected is a questionable food, as indicated by the experience of the unfortunate cattle. Why, then, should the director permit its use on human food? Those officials who deal with this subject have betrayed complete lack of responsibility and subservience to the profit motivation of corporations.

The action of the Imperial County Agricultural Commissioner in refusing to issue permits shows what can be done at state and county level if so desired. State and county authorities may exceed protection given by federal authorities if they feel inclined. The right to act more vigorously than federal officials gives local government a great advantage, and both farmers and urban customers

should press for such protection.

Paraquat is a weedkiller specifically listed for home use; yet a workman in a Los Angeles park was seriously poisoned. "Henry Fales' illness is a classic example of pesticide poisoning," Ida Honorof, consumer advocate, has written. "He collapsed on March 22, 1973 with an excruciating headache and vomiting blood, after spraying paraquat for four days. At this point he had only fifty per cent of his breathing capacity. When interviewed last week, he was still suffering from dizzy headaches, blurred vision, and difficulty in breathing." 74 *

A victory was gained in Los Angeles County when paraquat was banned for use in the county in parks and recreational areas and in schools. The county agricultural commissioner also has offered classes to all who will attend to instruct in the reading of labels and the danger involved in use of pesticides.

Pesticide poisoning has caught the medical profession unawares with few doctors understanding its full implications for particular patients. They are therefore at a loss in testifying regarding poisoning accidents, a circumstance which makes it difficult for victims to collect proper damages by legal action, and easy for employers, especially public agencies, to avoid responsibility. Workmen's Compensation claims are often not paid for long

* *Report to the Consumer*, published bimonthly, Ida Honorof, P.O.Box 5449, Sherman Oaks, California 91403.

range damage unless the injury is obvious, such as loss of limb . However, the effects of poison are deep within the body–to the kidneys, the liver, and the lungs–and industry–motivated scientists will come forward in any court action to deny any problem. When the average citizen presents a badly enlarged liver to his doctor, the doctor does not consider causes, for they are obscure and multiple, the thousands of contacts with poisons that every person has had in the chemical environment. If the home gardener has used paraquat, he has difficulty in isolating the incident from exposure to other pesticides, breathing smog, or consuming food additives; therefore, because of the multiplicity of assaults on the human body, each one escapes blame. The average citizen accepts illness as an act of God; for this reason he never dreams that his government is so careless of his welfare, and continues to buy products furnished in the market.

Dr. Granville Knight, a practicing physician in Santa Monica, California, has done considerable research on the effect of poison on the health of his patients. "From clinical observations for over 38 years, I am convinced that pesticides, as well as other chemicals in food, air, and water, are causing serious trouble in many unsuspecting individuals. . .unfortunately, most of our foods are now contaminated by small amounts of both types of chemicals (organophosphates and chlorinated hydrocarbons)," Dr. Knight testified before a committee of the California legislature, investigating the poisoning of lettuce by Monitor–4 in 1973. "My observations lead me to believe that the

so–called "virus" infections which are increasingly frequent over the past ten or fifteen years may very well be due in considerable part to contamination of our food supply, our air and our water with these chemicals."

PTA's, representing the children of the nation, might wish to ask questions. What pesticides are used in school cafeterias? Will they poison food or remain as residue on surfaces upon which food is placed? How long will the poison linger in the air? Do the arsenical weedkillers or 2,4–D used in soil blow as dust or contaminate childish hands? Would a child dare to drop food on the ground around these schools and then eat it, as children will?

It might be well to ask whether the school nurse understands that atropine is the antidote for cholinesterase inhibitors. Would principal or school nurse understand the symptoms? If poisons such as these are used in schools, these guardians of children's health should know the scientific literature which pertains to these poisons.

As citizens, these mothers might ask the school board what insect problems would arise if all poisons within the school, upon plants, and in the soil were omitted for a year. Is not all this a waste of money? If chlordane lasts for ten years, why is it used on a monthly or annual basis? Have they read the labels of the pesticides that they have ordered to determine whether they are correct in using them in areas where children play? If money is to be saved, why not explore this expenditure? Are they not the victims of salesmanship?

The following chemicals are used by the Los

Angeles school system: pyrethrins, diazinon, chlordane, Baygon, Resid, DDVP, Di–cumaral, boric powder, S.T.D. Subterranean Termite Control, 2,4–D, Dicamba, Amino–Triazol, Ansar H.C. 529, Fenac, Dymid, Treflan, Princep 80–W, AATrex 80–W, Karmex, Krovar I, Fandex, malathion, Sevin, Fruit Fix 800, Phytar 560, and Folck Oil.

It would be a fair conclusion that no one in the Los Angeles school system--neither the superintendent, any principal, the director of the operations branch, or any applicator–knows whether there is real need for these materials. They will quote authority if challenged, and this places responsibility again upon the Director of Food and Agriculture, who has supreme power.

The seriousness of this subject is underlined by a statement made by Samuel Epstein, M.D., chairman of the panel on mutagenicity in the Secretary's Commission on the Relationship of Pesticides to Environmental Health (the Mrak Commission): "Many diseases hitherto considered spontaneous, including cancer, birth defects, and genetic defects are environmentally induced, but the hazards are increased by the synergistic effects of chemicals introduced into the environment, which are carcinogens, mutagens, and teratogens." [75]

The Capistrano School District has the simplest and most reasonable approach: "As an ex–nurseryman and landscape contractor, I am aware of the damage that can result from the use of pesticides and harsh chemicals," said George W. Ballew,

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speaking for this school district. "It is because of this hazard that we have not used any pesticides for the past three years. I am sure that our school sites are as free of pest damage, if not freer, than any other school site in Southern California."

"Commissioners are concerned about the large number of poisonous materials found in retail channels," said Thomas E. Corn, Fresno County Agricultural Commissioner.[76]

He lists forty–nine pesticides sold in retail nurseries in the Fresno area; almost all are very toxic, and only three are nontoxic. The best sellers are malathion, chlordane, diazinon, and Isotox; the latter pesticide contains meta–systox, Sevin, and kelthane. Why such deadly chemicals should be combined when one would suffice is difficult to understand.

"The agricultural commissioners throughout California are deeply concerned about the safe use of pesticides in the home and garden sector," he continued. "The misuse of agricultural chemicals in the home tends to create a serious void in the public confidence of the pesticide surveillance program in the agricultural community.

"The agricultural commissioner has no clear statutory authority in the home garden pesticide area. The Director of Agriculture, under Chapter 2, Article 4, Section 12825, may after hearing cancel registrations of pesticides for reasons of public health and safety. The agricultural commissioners have cooperated closely with the Director of Agriculture in this responsibility."

Obviously a permit system, such as is applied

to agriculture, would not be practical to control the home market; therefore, People's Lobby advocates reduction in the number and toxicity of products offered in small quantities over the counter to housewives and home gardeners, and an educational campaign through the media and at all school levels to reduce use of household and home garden pesticides.

RECOMMENDATIONS

People's Lobby recommends the following:

1. that the Director of Food and Agriculture select the least harmful pesticide and/or method of application for each use in households and gardens and prohibit all others, and
2. that pesticides which are proved by any test to be carcinogenic or mutagenic should be considered very harmful.

CHAPTER XXI

THE URBAN PEST ERADICATORS' RIP--OFF

Robert Earl Rasp died while plying his trade as pest eradicator on March 19, 1975 in San Diego, and by his death underlined an area of neglect.[77] By filling the air with cyanide dust in an effort to kill a swarm of bees, he turned the attic into a

death chamber. Death must have come quickly; the occupant of the house heard him moaning, and he was dead on arrival at the hospital. His wife, youthful, grief–stricken, and tragic, wailed that her husband was skilled in his trade, but that is not the question. The real issue is that pest eradicators are handling poisons far too deadly.

The housewife is courting danger when she orders a pest eradicator to fill her house with fumes so lethal that they will kill all insects and keep the house free of pests for an indefinite period. For example, a very residual and dangerous poison must be used for cockroaches since it must remain to kill all pests that hatch from the eggs. For this reason there is a temptation to use chlordane, which kills on contact but also emits dangerous fumes, and therefore should be avoided in a kitchen. The housewife less impatient may do the work herself by using a product which combines boric acid with an attractant and placing it in dark corners frequented by these pests. The results are not so immediate, since one must wait until cockroaches find the poison.

In California no regulatory agency limits pest eradicators to safe methods or pesticides; therefore, the housewife is at the mercy of the judgment of the workman. When arriving at a friend's home in San Diego, I was amazed to find a workman squirting a stream of pesticide upon plants in a neighbor's yard and drifting it upon the friend's citrus tree. He did not know the name of the pesticide, but a telephone call to the employer revealed that it was chlordane. Although the man was fifty

feet from a building and standing in the midst of a flower garden, he was supposed to be treating for termites attacking the house. This is indicative of the type of service city dwellers are receiving.

Urban pest control companies have developed a profitable business centering upon destruction of ants with chlordane. Their sales argument is fraudulent, since they persuade customers that chlordane should be applied once a month, when it is really residual for ten years, and even then has products of the chemical change which are poisonous. However, thousands of people, especially owners of apartment houses, are persuaded that they should have all areas treated with this pesticide lest some person observe an ant. In fact, with many people the advent of any bug, no matter how innocuous, is cause for alarm and the complete treatment of premises with poison. Such is the triumph of advertising. It should be the duty of the government to protect the public against such waste of money and contamination of the environment.

The secret is not revealed that ants are beneficial insects devoting much effort to carrying insect eggs into their nests: if one wishes to discover what ants feed upon, he should observe that they are carrying eggs and fragments of insects. They are also honeydew feeders, pampering aphids for their honeydew secretion, but they do not attack plants. A few minutes ago a nurseryman on radio was bewailing the EPA suspension of chlordane registration, and suggesting that nothing could be done to control ants in the home garden. Like other

beneficial insects, feeding on pests, their population is increased or reduced by the amount of food available. This is nature's inexorable law, and it does not need to be supplemented by chlordane or any other chemical. In fact, home gardeners should beware of contaminating the soil of their gardens with a chlorinated hydrocarbon which is persistent and will appear as residue in root vegetables planted in this soil.

Ants also are natural enemies of subterranean termites, which protect themselves by making dirt runs on timbers of houses. For this reason if ants in the yard and under the house are let alone, house owners can avoid treatment for termites. If these facts were known, ants have the power of putting termite eradicators out of business. Since ants hold such a key place in the urban pest eradicator's business, one may expect a frantic publicity campaign of hatred against this humble insect and public gnashing of teeth regarding the EPA's decision regarding chlordane.

Filling the house with pesticide vapor in the manner of a commercial pest exterminator is dangerous folly. A housewife in La Mesa, California, with whom I am acquainted, had a shocking experience, which illustrates this. She hired an exterminator to treat her house during a seventeen-day vacation, and instructed a neighbor to open windows to air out the house during her absence. When the family returned, the baby began to suffer strangely: she had difficulty breathing and the pupils of her eyes contracted to pinpoints. The distress in breathing became so acute that the parents

feared that she would choke to death. The symptoms were so strange that the doctor could offer little help. However, they found that the baby was comfortable outside the house in the travel trailer, but immediately ill when brought into the house. The diagnosis was organophosphate poisoning from diazinon fumes released into the house by the pest eradicator. Although an effort had been made to air out the house, the fumes had lingered. When the temperature within the house and outside is the same, air does not move readily. Also carpets and drapes were saturated with the poison, and the parents had to throw away the carpet and renovate their house before the baby could be brought into the house.

When adults have these contacts with pesticide, they may, if healthy, suffer only minor distress. In this case the adults had headaches, the older children were slightly nauseated, so that they were kept home from school for a short time, but the baby was seriously affected. That gives a fair measure of the degree of susceptibility on the basis of age. So constant are contacts with pesticide that people have taught themselves that occasional illness is no real problem nor even a subtraction from good health. Of course, this is not true, for any illness has a cause, and repeated exposure to poison erodes health.

When the total environment grows lethal, especially in cities, it seems an act of cruelty to add deadly poisons. Apartment dwellers especially have difficulty in avoiding these pesticides, whatever their convictions or susceptibility. When Ida

Honorof entered the apartment building where she resides on February 17, 1975, she noticed a man with a tank and a wand spraying the walk and paying no attention to children and older people constantly walking in the area. Under questioning, he admitted that he was using diazinon, but continued spraying. A protest to the county agricultural commissioner and to the director proved useless, since spraying, promoted by active advertising, has become universal.

"At the time I moved to California in 1961," Ms. Honorof has written to the director, "I was talked into contracting with a monthly pest control company, who would spray the inside and outside of my home once a month with highly toxic pesticides, some of which are now illegal. I developed a kidney infection, which continued as long as my home continued to be sprayed. To this day, contact with many pesticides immediately triggers an adverse reaction." 78

This summarizes the experience of all who believe that the least harmful method be selected for control of household pests. There are ways to control insects without poisoning the public, and government must be motivated to make these non-toxic methods the only legal approach. All discussion of labels and other minor matters are superfluous; the central issue is that too toxic chemicals are diffused widely in the environment, and that profits of companies engaged in this business gain greater sympathy than human welfare. Until this central issue is faced, officials will deal with each incident of poisoning brought to their attention as

an exception to the rule, and the complaining citizen will become enemy to be argued or placated into acquiescence. In their own mind they have identified themselves with business interests. Until citizens can be accorded credibility and standing, there will be no proper enforcement of any regulation regarding pesticides, and the entire system of government in the United States is in serious trouble.

One of the problems of this wholly unregulated industry is divided authority in urban areas. The Structural Pest Control Board in California supervises pesticide use within the house, and the county agricultural commissioner acting under direction of the Director of Food and Agriculture, regulates use in yards and gardens. Thus cockroaches and termites within the house would come under the Structural Pest Control Board, and ants would create a problem, for inside the house they would be regulated like cockroaches, but in the yard would fall under different jurisdiction. Logically bees in the attic, which motivated Robert Earl Rasp to fatal use of cyanide, would be cared for by the county bee inspector, but they were inside a house. The problem seems to be solved by a lack of concern by all agencies. In a practical way activities are unified by a single company spraying both house and garden.

The Federal Environmental Pesticide Control Act provides that applicators of pesticides be certified or work under supervision of a certified applicator. States are required to do the certifying and must submit a plan for approval of EPA by

October 31, 1975.

If this certification is given urban pest eradicators without a permit system such as required for agricultural applicators, the result will be detrimental. Certification will give these profit-motivated workmen without real education in pesticides standing and credibility, and will not in any way regulate them. As certified experts they will dominate, and as one gloomy agricultural commissioner predicted, the industry will regulate itself.

RECOMMENDATIONS

People's Lobby recommends that the following action be taken:

1. that supervision and control of all urban pesticide use be placed under the jurisdiction of the Department of Food and Agriculture and the Department of Health,
2. that the two regulatory agencies cooperatively develop rules for the protection of the public and the guidance of commercial pest eradicators,
3. that each commercial company or individual engaged in urban pest eradication be certified or licensed by the two agencies having jurisdiction, and that this license be revocable on violation of regulations,
4. that each commercial pest eradicator secure a permit from the County Agricultural Commissioner and the Department of Health for each spraying job,
5. that the two regulatory agencies use all

media to inform the public how to reduce use of pesticides, and that this educational campaign be repeated at appropriate intervals, and
6. that the list of least toxic pesticides prepared by the Director of Agriculture for household and home garden use be applicable to commercial pest eradicators.

CHAPTER XXII

PESTICIDE MANUFACTURERS ATTACK EPA

Pesticide manufacturers have attacked EPA by an amendment to the Federal Environmental Pesticide Control Act, now pending in Congress, to give USDA veto power over EPA's regulation of pesticides. EPA has dared to ban certain chlorinated hydrocarbons, which I have noted as rejected by farmers, thrust upon home gardeners and housewives by the California Director of Agriculture, and denied registration by EPA. This, then, is the battle to restore these pesticides, and to prove that huge monopolies manufacturing pesticides cannot be regulated.

To pesticide manufacturers cancellation of registration of DDT, aldrin, and dieldrin and suspension of registration of chlordane and heptachlor were unforgivable acts. It is not a mitigating circumstance for them that the Environmental Defense

Fund had won court decisions commanding much of this activity. The possible addition of mirex to the list and the resulting demise of the fire-ant eradication program in the South by removal of this material have inflamed Jamie Whitten, master of agricultural appropriations. By control of purse strings, he has been rated more powerful than the Secretary of Agriculture, and reportedly has vowed vengeance against those who opposed this program. That it has continued for thirteen years without eradicating fire ants did not disturb him; it has been one of the most satisfactory boondoggles in Washington.

The monopolies manufacturing pesticides are accustomed to control registration of their products: by unique legislation, not repealed until 1964, they registered "under protest" any pesticide disapproved by officials. Such pesticides could be manufactured and sold like any other pesticide, and could be displaced only by evidence sufficient for court action. Such evidence seldom can be based entirely upon animal experiments, but must be reinforced by a long history of destruction of the environment and damage to human health, so that even questionable products will be used indefinitely. Thus registration became a hoax, since checking of toxicity was a factor only in determining tolerances. Fictions developed that airplanes applying poison by the ton could leave residue in parts per million and be always exact, and that chemical change would always reduce toxicity. When a pesticide should have been rejected, zero tolerance was assigned. Under these rules, the

majority of pesticides were registered. *

This control of federal agencies by the oil–pesticide complex is symptomatic of a decay of democracy centering in the federal government and permeating lower levels of government. In 1892, when railroad regulation was the issue, Richard Olney, just before leaving his law practice to become Attorney General for Grover Cleveland, was asked by a client to abolish the Interstate Commerce Commission. His reply, now known as Olney's law, has directed corporation policy to this day. He advised that regulation should not be attacked directly, but that it could become an asset to those regulated. By enactment of special interest legislation and by control of regulatory agencies, this could be accomplished. The USDA is a prime example of this policy.

This love affair between pesticide manufacturers and the USDA, legalized by Congress as a marriage by "protest" registration, was interrupted by creation of EPA in December, 1970, and EPA was given the task of reviewing 28,500 pesticides registered by the federal government and 14,000 by state governments. Although Congress in 1964 had repealed "protest" registration, the habit of lenience had persisted.

Nor could cancellation be used effectively, as noted by the House Committeee on Government Operations: "Although the 1964 amendments to

* See appendix for a complete history of pesticide legislation.

the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provided basic legal authority for cancellation of pesticide registrations, this authority could not be utilized in contested cases until rules of practice for hearings had been promulgated. Such rules did not become effective until August 28, 1969, more than five years after the amendments were adopted." [79] Obviously cancellation or suspension of registration could be invoked only against small companies that would not contest the action.

The Committee on Government Operations of the House of Representatives has delved deeply into these matters, and all should read the eleventh report of this committee, issued in 1969.

The relationship of the USDA with the oil–pesticide complex can best be assessed by reviewing the history of registration of the Shell No–Pest Strip, as described by this committee. This registration had doubtful moments because behind it lay the scandal of the lindane vaporizer. Lindane, a chlorinated hydrocarbon similar to DDT but more toxic, placed upon an electrically heated screen, vaporized to kill insects. Obviously anything so potent added to air in closed rooms would be detrimental to health, but this device was registered in the early 1950's and used for twenty years. During this period many attempted to stop its use, and a large number of cities passed ordinances against it. The Shell No–Pest Strip was a similar device consisting of strips coated with resin impregnated with DDVP and emitting a vapor for three months sufficiently strong to kill insects within a room.

USDA would have been a lonely place without representatives of Shell Chemical Company to guide registration and dictate language on labels. John S. Leary, Jr., Chief Staff Officer for Pharmacology of the Pesticide Regulation Division, remained with USDA until registration of the Shell product had been completed, and then went to work for Shell Chemical Company. In his closing days of government employment, he substituted a report of his own favorable to the Shell No–Pest Strip for a report from the Public Health Service Ad Hoc Committee on Vaporizing Devices critical of the strips, and performed other services for Shell.

Dr. Mitchell R. Zavon was consultant for Shell Chemical Company and USDA simultaneously from March 13, 1963 until June 30, 1969, and held stock in a Shell affiliate. He also served as chairman, toxicology committee, National Agricultural Chemicals Association. He provided scientific studies to support the alleged safety of the Shell No–Pest Strip, used as expert testimony by Shell. One of his reports alleged that no residue appeared on food exposed to this vaporizing device, a conclusion contradicted by other research. Often in meetings regarding these matters, it was difficult to determine whether he represented Shell Chemical Company or the government.

Dr. Roy T. Hansberry was Assistant Director, Agricultural Research Division, Shell Development Company, Modesto, California. Shell Development Company is an affiliate of Shell Chemical Company, a division of Shell Oil Company. He had

been appointed by the Secretary of Agriculture to serve on a committee to establish criteria for registration, and presumably kept a kindly surveillance of Shell No–Pest Strip.

The Committee on Government Operations referred these cases of violation of federal conflict–of–interest legislation to the Justice Department but nothing was done. There must have been amazement that a practice so common would be criticized.

It is needless to say that the Shell No–Pest Strip, so tenderly monitored, would be accepted for use in homes. The battle centered upon its use in restaurants and the language of the label. Shell won permission to use the strip in restaurants, but was compelled to put a warning on the label that it should not be used in rooms where there were infants, ill, or aged persons. How this caution could be obeyed in restaurants and homes was not disclosed.

Other extraordinary events center upon ownership of DDVP. On February 1, 1955, then Secretary of HEW Hobby called a press conference to announce the discovery by research scientists at the Savannah, Georgia, laboratory of the Public Health Service's Communicable Disease Center of DDVP, a new insecticide called "more potent in killing insects than many modern economic poisons."

Although the federal government had the entire right to this pesticide, all companies were given an equal opportunity to manufacture it. However, somehow in the devious maneuvering which USDA

substitutes for honest administration, Shell Chemical Company became sole owner, and two registrations were issued to Shell and six to other companies that planned to purchase from Shell. The only suspension of registration issued by USDA was against Aeroseal Company, Camp Hill, Pennsylvania, involving a DDVP strip similar and competitive with the Shell No–Pest Strip. If Olney's law is applied, one of the greatest values of regulation is the promotion of monopoly by elimination of competition.

The Poage–Wampler amendment to the Federal Environmental Pesticide Control Act would give the Secretary of Agriculture veto power over EPA by requiring his concurrence in procedures leading to cancellation or change of classification of a pesticide and in any pesticide regulation issued by EPA. It would also delay for one more year full review of registration and classification of all pesticides by the new, stricter specifications adopted since 1972, putting some in a restricted category, perhaps taking some off the market. It would delay setting rules for certification of pesticide applicators.

When a lawyer wishes to prevent an action, he devises endless procedure making for delay. Such is the motivation of this amendment. If two departments participate and one of these like the USDA is sympathetic to corporations, industry will enter again that corporation–controlled heaven that it once enjoyed. In obedience to Olney's advice, the thrust is not for repeal of all regulation but for its perversion into something ineffective

and monstrous. Later, perhaps, when regulation has been reduced to hopeless confusion, corporations in the name of laissez faire can ridicule government control and bring it into disrepute. The plan is Machiavellian but transparent.

On the other hand, EPA should be commended for making a brave showing in enforcement of pesticide regulation for human welfare. As if the technical work of assessing danger and value of thousands of pesticides was not enough, officials have dared to make an impartial, scientific evaluation of products manufactured by corporations accustomed to write their own laws and to dictate their administration. They should be permitted to continue their work without harassment of union with an agency such as USDA unfavorable to such objectives.

If Congress truly wishes to serve the people, it will give encouragement to that group of scientists in the USDA who have investigated an integrated pest control program and biological control of insect pests. These scientists have done important research and could join with scientists in the same field in the universities to lead American farmers to improved methods of pest control. They are now submerged in the Department and do not govern policy; therefore, they are given little standing, but Congress could give them recognition. This would be a favorable ending for this episode.

CHAPTER XXIII

WHAT CAN THE PEOPLE DO?

The problems recited here apply not to California alone but to all other states and to the federal government, worst offender of all. Officials are caught in a vast network of intrigue whereby private interests seeking their own profit have suborned all levels of government, nor have they omitted to dictate legislation favorable to themselves to legislatures and to Congress. Most active has been the oil–pesticide complex.

There are some officials who do not fit the mold, for in every bad system there are good men: I remember one retired official in the California Department of Food and Agriculture, who discussed frankly the lobbying within that department and advised me to continue to seek reform. A rising people's movement will strengthen these men who deplore the sytem which has trapped them. While it is possible that the people by their inertia and silence have permitted all this, the people do have one advantage: they are more numerous than those now having greater influence.

GATHERING INFORMATION

The first step for the citizen is to gather information and to assemble a few around him who wish reform. Officials at all levels of the

government–school districts, cities, counties, and states–should be asked what pesticides are used and for what reason, how they are applied, how the workmen and the people are protected, and what laws govern their use. There are excellent books on the toxicity and danger of various pesticides. University authorities may be consulted, especially the department of biological control in the state agricultural college, having information on nontoxic methods. One bit of research will lead to another, until these citizens will find themselves armed with facts.

THE EDUCATIONAL CAMPAIGN

After the group has decided upon a suitable reform, the leader should make a friendly approach to the proper official, perhaps the superintendent of schools, to request purchase of less toxic pesticides or use of nontoxic methods of control. These officials are usually well intentioned but ill informed about the subject; therefore, while progress may be slow, there is chance of success. If one wishes to move to higher levels, there are the city council and the board of supervisors to be questioned in regard to their pesticide purchases. However, the group may wish to interview the state director of agriculture, or to initiate a state law. These members of the legislature could have moved for reform years ago; therefore, do not be surprised if good legislation is killed in committee or amended beyond recognition. This is an opportunity presented to them for courtesy's sake. Do not linger too long

in legislative halls if the effort seems likely to be unproductive.

THE INITIATIVE

People's Lobby uses the initiative to present legislation because of a belief that there should be meaningful communication between people and government, and that an idea conveys no message unless it can be enforced. The healthiest government is one in which the people, speaking through direct legislation, become an additional force in government, instructing their elected representatives regarding their needs and their will. In a system of checks and balances, the voting power of the people, expressed by the initiative, referendum, and recall, is the only reasonable and constitutional check.

People's Lobby first revived the people's initiative in California by placing on the ballot and enacting into law the Political Reform Act of 1974. Now many national as well as state and local groups together with People's Lobby are promoting increased use of direct legislation in the Western Block of states that have these direct legislative processes.

In nineteen states, groups are drafting initiatives, filing them with the proper individuals, and gathering signatures, so that initiatives on a variety of subjects will appear in these states for voting in 1976. This is a people's movement, a remedy for the political doldrums into which the United States has drifted. The initiative is legal only in

twenty–two states, but this can be overcome. If America is to be saved, this must be a valid alternative for the voting public in every state in the Union. Forward, then, let us move to secure a national initiative, valid at the federal level, so that the people can communicate their will to Congress and to the President. Such are the plans that are forming.

USING AN INITIATIVE

People who have sought legislative remedy and have failed may frame their own initiative–local or state as they will--secure the proper number of signatures for the ballot, and move into a campaign. Whether they win or lose in the election, they have found a valuable tool for reform. Let them never lay it aside. If an election is lost, regard it as an educational effort and later return the issue to the ballot. Let all the dark corners of government where abuses have lingered be cleansed thus. The final answer is not frustration, but victory.

GLOSSARY

Alien species – an organism which has invaded and is growing in a new region.

Biological control -- the regulation of plant and animal numbers by natural enemies; also, the use by man of natural enemies to control (reduce) the numbers of a pest animal or weed.

Biotic agents – living environmental factors which favor the well–being or bring about the premature death of animals or plants.

Broad–spectrum pesticide -- a material of such broad toxicity that it kills not only a range of pest species but also many nontarget species, such as natural enemies, honeybees, birds, and other forms of wild life.

Colonization – the controlled release of a quantity of biological control agents in a favorable environment for the purpose of permanent or temporary establishment.

Control -- reduction of pest population by colonization of natural enemies so that it is no longer an economic threat.

Cultural control -- a pest control method where normal farming practices–tilling, planting, crop spacing, irrigating, harvesting, waste disposal, crop rotation–are altered so that the environment is less favorable for the pest.

Economic threshold – the density of a pest population below which it fails to cause enough injury to the crop to justify cost of control efforts.

Encapsulation – an immune response of certain insect hosts to nonadapted parasitoid eggs and

young larvae wherein the immature parasitoids become covered with and eventually encysted by certain host blood cells, with death of the parasitoids soon following.

Eradication of pests – the complete destruction of the entire population of the pest.

Exotic species – an organism which evolved in one part of the world and which now occurs either accidentally or intentionally by man in a new region.

Food chain – a succession of populations through which energy flows as a result of consumer–consumed relationships.

Host plant resistance – a method of pest control in which crop varieties are used which are resistant, tolerant, or unattractive to the pest.

Hyperparasite – an insect which is parasitic in or on another parasitic insect.

Integrated control – an ecologically based, pest population management system which uses all suitable techniques to reduce or so manipulate the pest population that it is prevented from causing economically unacceptable injury to the crop.

Mass culture – the propagation in an insectary of very large numbers of a biological control agent.

Microbial insecticide – a material composed of or containing microbes or their toxic products for use in controlling insect pests.

Natural control – the collective action of environmental factors to maintain the numbers of a population within certain upper and lower

limits over a period of time.

Natural enemy – a small organism which lives and feeds on another larger host.

Parasitoid – a parasitic insect that lives in or on and eventually kills a larger host insect.

Pest – a species which because of its high numbers is able to inflict substantial harm to man, domesticated animals, or cultivated crops.

Petrochemical agriculture – farming in which pest control is accomplished by pesticides manufactured from the byproducts of oil.

Predator – an animal which feeds upon other animals smaller or weaker than himself.

Secondary pest outbreak – rapid increase to pest status of a scarce insect formerly under biological control after use of a broad–spectrum insecticide, which has destroyed its natural enemies.

Sterile insect control – a pest control method that makes use of artificially sterilized pests to mate with the target pests with race suicide the result.

Upset in pest control – secondary pest outbreak.

APPENDIX

THE BIONETICS REPORT

The Bionetics Report, prepared by the Bionetics Research Laboratories, Bethesda, Maryland, under contract with the Department of Health, Education and Welfare.

ANALYSIS OF CANCER

SUMMARY SHEET

PROJECT No. 16–CARCINOGENESIS ASSAY STUDIES

P.M.No. 66/709

Compound Name SEVIN — Date Killed 10–6–66

Compound No. 047–I, Oral — Date Completed 7–19–67

	B6C3F1 Male	B6C3F1 Fem	B6AKF1 Male	B6AKF1 Fem
No. mice at start	18	18	18	18
No. mice surviving 18 months	16	18	17	18
No. mice missing (no necropsy or tissue missing)	1	0	0	0
No. mice died during experiment	1	0	1	0
No. mice negative (killed and died)	6	12	11	13
No. mice died with tumors	1	0	0	0
No. mice killed with tumors	5	1	2	2

No. mice killed or died, other diseases	6	5	5	3
Tumors				
Lymphatic Leukemia	0	0	0	0
Reticulum Cell Sarcoma, Type A	0	0	0	1
Reticulum Cell Sarcoma, Type B	0	0	0	0
Pulmonary Adenoma	3	0	1	1
Pulmonary Carcinoma	0	0	0	0
Hepatoma	3	0	1	0
Hepatic Carcinoma with Pulmonary metastases	0	0	0	0
Mammary Carcinoma	0	1	0	0
Carcinoma, skin	0	0	0	0
Other types				
Angioma, spleen	1	0	0	0
Total Number of Tumors	7	1	2	2
Common other Lesions				
Focal necrosis, liver	1	0	0	0
Follicular hyperplasia, spleen	2	1	0	0
Focal pneumonia	3	1	5	1
Follicular hyperplasia, Peyer's Patch	0	1	0	0
Lymphoid infiltration, lung	0	2	0	2

Signed: Borge M. Olland

Borge M. Olland, D.M.V.

BRL Fm. 449

ANALYSIS OF BIRTH DEFORMITY

TABLE A–13 (cont.)

SEVIN (BRL No. 047)

Administered Subcutaneously in DMSO

Strain	BL6	(BL6)	BL6*	B6AK
Dosage(mg/kg)	100	100	100	100
No. Litters	6	5	7	6
Total No. Fetuses	45	27	43	52
Necropsied	30	22	33	27
Alizarin Stained	15	5	10	25
Implantations per Litter	$9.0^{I} + .4$	9.0	$7.5 + .8$	$8.7 + .6$
Live Fetuses per Litter	$7.8 + 1.0$	5.2	$7.2^{I} + .01$	$8.7 + .6$
Fetal Mortality(%)	13	42	7	0
No. Abnormal Fetuses	22	2	6	0
Percent	49^{I}	7	14	0
Anomalies Observed	Angathia(1)	Microph–thalmia(2)	Anoph–thalmia(3)	None
	Micro–gnathia(2)		Microph–thalmia(3)	

	Short Snout(1)		Hydro–cephaly(1)	
	Anoph–thalmia(7)		Cystic Kidney(1)	
	Micro–thalmia(7)		Corkscrew Tail(1)	
	Hydro–cephaly(4)			
	Exen–cephaly(1)			
	Ectopic Viscera(1)			
	Umbilical Hernia(2)			
	Syndac–tyly(4)			
	Clubfoot(2)			
Fetal Weight(mg)	$682^{D} + 45$	834	$839 + 45$	$892^{D} + 71$
Crown–Rump Length(cm)	$1.65^{D} + .05$	—	$1.78^{D} + .05$	—
Placental Weight(mg)	$98^{D} + 3$	115	$110 + 5$	$111 + 5$
Amniotic Fluid per Fetus (mg)	$192 + 10$	266	$159^{D} + 10$	$174 + 24$
Maternal Weight Gain (gm)	$4.22^{D} + .79$	4.29	$3.75^{D} + .25$	$2.56^{D} + .87$
Maternal Liver Wgt(% of body)	$7.51^{I} + .22$	6.1	$6.44^{D} + .1$	$6.98 + .32$

SWORN AFFIDAVIT BY DEPARTMENT OF FOOD AND AGRICULTURE

JAPANESE BEETLE FINDS

BALBOA PARK 1973

DATE	FIND LOCATION	SEX	HOST
7/2/73	Morley Field, Upas & Ala.	M	Lawn–Mrs. Rosenberger
7/20/73	Morley Field, Upas & Ala.	M	(live) Trap
7/23/73	War Memorial Building	?	(live) Trap
7/24/73	Zoo Pl. & Park Blvd.	M	(live) Trap
7/24/73	Natural History Museum, Rose Garden	M	(live)pink rose
7/24/73	" " "	Gravid F	(live)pink
7/24/73	" " "	M	(live)pink rose
7/24/73	" " "	M	(live)pink rose
7/24/73	" " "	F	(live)pink rose
7/25/73	" " "	F	(live)pink rose
7/26/73	War Memorial Building	F	(live) Trap
7/26/73	Natural History Museum, Rose Garden	M	(live)pink rose
7/30/73	" " "	M	(dead) under yellow rose
7/30/73	War Memorial Building	M	Trap
7/30/73	Natural History Museum, Rose Garden	M	(dead)under rose
8/29/73	Confirmed (dead) El Cajon Blvd. & Alabama Street	M	(dead) Trap
9/6/73	3217 30th Street, San Diego	M	(dead) Trap

NOTE: 7 in Traps
9 on host plants (roses)
1 on lawn (Rosenberger)

TOTAL: 17

CORRESPONDENCE REGARDING ERADICATION OF BEETLES

Sandra D. Scharr
1834 Donax Ave.
Imperial Beach, Ca 92032

State Dept. of Agriculture
Mr. Bob Anderson
1120 N. Street
Sacramento, Ca

RETYPED FOR REPRODUCTION ORIGINAL LETTER ON FILE WITH People's Lobby 3456 W. Olympic Blvd. Los Angeles, Calif 90019 (212)731–8321

Dear Mr. Anderson:

I was a surveyor for the Japanese Beetle Project in San Diego from the middle of May to August 15, 1974. I terminated my employment in August due to discrepancies in the Project. When I began working for the Program I was a little bothered by the fact that I could get no information from my supervisors concerning the safety of chlordane use; they only repeated that Sevin dust is relatively safe.

During the week prior to my termination Dave Reyes, my immediate supervisor, placed me with a new partner, Russ Skillman. Up until that date I took the Project seriously; at most residences I took a plant host count and checked for damage. I had heard that some of the supervisors were falsifying information on the cards and taking time off for errands, etc. But I was really surprised when Russ didn't even bother to walk around the blocks when we had residential areas around 40 th Street. Instead, he asked me if I minded if we went to Chula Vista to pick up his check from his weekend employment. You can verify this by consulting his weekend employer and by checking the August mileage sheet for car No. E834018, a 1974 station wagon. If he hasn't rewritten a new August mileage sheet, it will be quite evident to you that a number of the mileage figures have been altered to cover up the fact that he was driving all over San Diego on various errands, to the beach etc. When I questioned him as to how he rationalized not even checking the plants, he replied that the project was a hoax. As evidence for his belief, he explained that in the residential areas, where one beetle

was found, the traps are only 20% effective, while at the airport where there were only ten traps placed at the time a beetle was found, the traps were 1% effective. Also the trap in which the beetle there was found, was located in an area to which the beetle theoretically would not be attracted. According to Russ, who had checked the area, there was no beetle damage either. Then after talking to me, Russ reported this belief to Dave Ryees,who at first vehemently denied that the "traps were salted." Russ asked Dave who was the first person to find a beetle last year and Dave replied that "about the time Rosenberger (who works in Imperial Beach) was about to be canned" his wife (Mrs. Rosenberger) produced a Japanese beetle from her purse which she claimed to have found in Balboa Park a week before. Russ then asked Dave if he thought it a little strange that it was Mrs. Rosenberger who was the only person to find a Japanese beetle in San Diego which was not confined to a trap. Afterwards, Russ told me he wasn't going to say anything about this until the last week or so of the Program because he needed the job.

That week a trapper, Gale Schroeder, found a Japanese beetle in a trap in downtown San Diego which was missing a few parts not found in the trap. Dick Fehlman from Sacramento was supposed to have examined the beetle and said that the beetle had appeared to have been planted. The following Monday I learned that the Friday before, August 9, 1974, Dave Reyes was forced to resign and Russ was appointed the new supervisor. You can imagine my surprise at learning this. I found it hard to believe that Russ, who probably did less work than anyone on the Project, who believed the Project to be a hoax and was one of the last surveyors to be hired, was now a supervisor. I was very angry when he placed me with a new partner with whom I had nothing in common and would have to spend my lunch time and break. She was also known as the hardest worker on the Project and, after Russ had told me about his hoax theory, I didn't feel too enthusiastic about putting extra effort into the Program. I asked Russ to place me with another surveyor, something which surveyors had been doing throughout the program. Russ said Gordon Tween, his supervisor, had given him these instructions. I questioned Gordon about this and was told that Russ had a free hand in these matters. I went back to Russ and he told me that I would have to work with this surveyor for the remainder of the Project.

It seems quite evident to me that Russ did this to antagonize me to the point of quitting, so that I wouldn't be around to repeat his

story and let out any information concerning his "working habits."

I hope that you find this information useful and would appreciate a reply.

Sincerely yours,

Sandra Scharr

THE SUPERIOR COURT

COUNTY OF SAN DIEGO
GRAND JURY
7003 Courthouse
SAN DIEGO, CALIFORNIA 92101

April 24, 1975

People's Lobby
Mr. Ed Koupal, Director
P.O.Box 33194
San Diego, California 92103

COPY

Re: Grand Jury File 74–71

Dear Mr. Koupal:

The Grand Jury has completed its inquiry into your complaint regarding an apparent fraud within the State Department of Agriculture concerning the Japanese Beetle Project. Specifically, your complaint alleged that Japanese beetles were imported to the San Diego area to justify massive insecticide spraying in this area at a cost of over one million dollars of taxpayer funds. The allegations in your complaint were based primarily on a letter from a former employee on the project, Sandra Scharr.

The jurisdiction of the Grand Jury for this inquiry is defined in the California Penal Code:

> Sec. 917: The grand jury may inquire into all public offenses committed or triable within the county and present them to

the court by indictment.

Sec. 919: The grand jury shall inquire into . . . . . .
(c) The willful or corrupt misconduct in office of public officers of every description within the county.

Although the Grand Jury does not have the power to inquire into the manner in which a state department operates, as it does for county offices, it believes it should comment upon any faulty practices and procedures brought to its attention during such an inquiry.

In response to a Grand Jury request to Mr. K. Little, Jr., Agricultural Commissioner, County of San Diego, for fiscal and statistical data on the Japanese Beetle Project, the following data was received.

1. A Japanese beetle was found in Balboa Park, San Diego, on July 2, 1973. Subsequently sixteen (16) more beetles were found through July 24, 1974. Each find was officially recorded and reported on California Department of Agriculture, Plant Industry–Pest and Damage record. These records contain all pertinent and applicable data on findings including:

Location
Collector's name
Identification
Date
Specimen condition
Other information

Each find was forwarded to the State Department of Agriculture for positive identification, authentication and determination.

2. The Director of Food and Agriculture, after evalution of the initial beetle finds, declared the entire County of San Diego a Japanese Beetle Eradication area and issued, on August 13, 1973, regulations petaining to the area. Attachment (1) is a copy of the order. This order was deemed necessary for the immediate preservation of the public peace, health, safety or general welfare.

3. In compliance with the order, the San Diego County Department of Agriculture formulated an "operational Plan for the Japanese Eradication Project -- 1974," which commenced on August 8, 1973. Attachment (2) is a copy of the operational plan.

4. Attachment (3) is a report by the City of San Diego Quality of Life Board Pesiticide Committee on the State and County Japanese Beetle Eradication Program. This report addresses the Cost/Benefit, Health/Medical, Physical/Chemical, and Procedures/Alternatives of the program.

5. The original funding for the program came from the state Department of Food and Agriculture's emergency fund. The emergency fund is derived from gasoline taxes for which refunds have not been claimed by farmers. The total expenditures of both state and county programs was $306,591 for fiscal year 1974. Of that amount, San Diego County spent $118,731 under contract to the State. The current fiscal year (74–75) is funded from the State General Fund and amounts to approximately $550,000. Of this amount, the County of San Diego is operating under a $130,000 contract to perform work in Balboa Park, San Diego. This contract is effective from July 1, 1974 to June 30, 1975. In both the State and County programs, costs primarily reflect labor and equipment because the pesticides are provided by the USDA eradication program funds. Federal expenditures to date total $13,515.

The Grand Jury Committee conducting the inquiry contacted the original complainant, Sandra Scharr, and attempted to arrange a mutual time for interview. Three tentative appointments were set up but two were cancelled by her and one by the Jury due to its business. Sandra Scharr then informed the Committee that, other than her statement, she had no additional factual information. The Committee interviewed Russ Skillman, Sandra Scharr's partner. He denied the statement attributed to him "That the project was a hoax." Further, Mr. Skillman had previously admitted to his supervisors that he had made improper use of a state vehicle. He volunteered to reimburse the State for costs but instead was issued an official reprimand. Mr. Skillman had no factual knowledge of beetles being imported into the San Diego area nor of any traps being salted with Japanese beetles.

An interview with Mr. Richard Fehlman, State Supervisor, verified the Japanese Beetle finds and the State procedures for identification, authentication and determination.

CONCLUSION:

The Grand Jury after consideration of State and County data and evaluation of personal interviews concluded that

1. The Japanese beetle finds in San Diego County were valid and these finds constituted an infestation of this voracious pest.

2. The beetle eradication program was appropriate in view of the realistic threat to residential ornamentals and a large portion of the agricultural industry.

3. The best known approved method of eradication, taking into account both safety and effectiveness, is the combination of chlordane and carbaryl which was used in the program in accordance with the operational plan (Attachment 2).

4. There is no evidence of willful or corrupt misconduct by County officials or employees.

5. There was no factual data presented to substantiate the charge that Japanese beetles were imported into the San Diego area.

6. The findings of Japanese beetles, operational eradication programs, procedures utilized and funding were completely legitimate and justified and did not constitute a "fraud" and "flagrant misuse of over one million dollars of taxpayers funds."

Yours very truly,

SAN DIEGO COUNTY GRAND JURY

/s/ Edward H. Hinkle, Foreman

/s/ George Z. Kraber, Chairman
Public Works Committee

COMMITTEE

P.O.BOX 33194
SAN DIEGO, CALIF. 92103

May 9, 1975

Edward H. Hinkle, Foreman
George Z. Kraber, Chrm., Public Works Committee
Diego County Grand Jury
Courthouse
Diego, California 92101

Re: Your File No. 74–71, Grand Jury
Our File: "Health–oriented Watergate"

Dear Sirs:

After careful consideration of your letter of April 24, 1975 addressed to People's Lobby, with a copy to our committee, members of the Informed Citizens Union wish to lodge a formal complaint and dissent from the findings of the Grand Jury case referenced.

We will appreciate being informed as to what governmental forms or method of notification of all the Grand Jury members -- whether involved in the Public Works committee activities or not – are needed. We wish to make certain our dissent is a matter of permanent record, available to the public, as the future events continue to call into question the activities of the departments of agriculture in this County, and your whitewash of same.

We also wish to protest your discretionary sealing of the transcript of this "investigation," inasmuch as information has been consistently given to the personnel of the departments of agriculture and cannot be held to be "secret" except from the individuals and organizations who brought the complaints. Precedents for the release of the transcript already exist; i.e., the 'bigger' cases of the Yellow Cab scandals, and the more recent Oceanside Police investigation.

Inasmuch as officers of ICU wrote you on the date of Oct. 1, 1974, Nov. 24, 1974 and Dec. 19, 1974, and forwarded to you the names of individuals who had worked for the departments of agriculture and who were knowledgeable of the abuse of power, mismanagement and fraud involved in the so–called Japanese Beetle Eradication Project, we expected these individuals to be called by the Grand Jury, and their testimony taken UNDER OATH. This was

not done, although it related directly to the 17 beetles found [illegible] which more than half were dead (according to Mr. Little in [illegible] Council testimony), and to the surprising contention that some [illegible] the beetles had been "planted" in the traps, as well as employ[illegible] testimony that some were in such state of deterioration they could not have flown into the traps. If you noted in your list of 'findings' the "live" finds all occurred during one week – July 20, 1973 – July 26, 1973. The beetles apparently were not viable, since all remaining finds were dead. We feel the live beetles were transported into San Diego alive – if you had had independent entomology testimony, you would have learned they can live 10 days without food, water or air – in fact, ladybug beetles are uniformly shipped, alive as are queen bees, etc. The absence of pinholes, showing the beetles did not originate from a dried collection is sheer nonsense, and a smoke screen.

We realize you have the discretion to keep the complaints, the investigation and the results secret, but wewish to know whether or not the testimony of Mr. Little and Mr. Fehlman was taken under oath. An immediate reply to this question is imperative to our further investigation of this abuse of power.

We question the adequacy of the investigation in part for the following:

1) No testimony was taken from Sandra Scharr and Frank Porter under oath, nor the anonymous former employee who got his job through his father, a VIP in City government, known to Lucy Pryde, as pointed out to you in 1974.
2) No medical testimony was taken, nor review attempted of the American Cancer Research Scientists reports of the health hazards of these chemicals to the *illegally unprotected* young workers – most of them young college students. Your inaction in this regard means no one can warn the young people of the clear and present and future dangers of taking one of the "soft jobs" for their summer employment. Did you question any OSHA officials, or read any labels of the chemicals – the restrictions of which are the basis for the "registered use" so often mentioned by top employees of the agriculture departments.
3) No testimony was taken under oath, or at all, from any member of the city Quality of Life Board,or the Pesticide sub–committee of that Board.
4) No testimony was taken at all from any of the individuals who

attested to having been made ill by the spraying programs.
5) No testimony under oath was taken from any officials of the Environmental Protection Agency regarding the "safety" of chlordane (now under a proposed ban by EPA, as have been others of the chlorinated hydrocarbons).
6) No testimony was indicated as having come from officials of the Federal Aviation Administration regarding the illegal helicopter spraying over the city, nor of anyone knowledgeable in the field of wind drift of pesticides.
7) You indicate no testimony from any independent scientists regarding the required cost–benefit analysis of any such magnificent misuse of tax funds.
8) There is no indication the "investigation" concerned itself with the Federal Trade Commission/Union Carbide Consent Agreement signed Feb. 4, 1974 in which the manufacturer is restrained from advertising Sevin as "safe, won't drift, harmless to human beings, warm–blooded animals, birds, fish, beneficial insects, or the environment." (Dept. of Agriculture are exempt! p. 10 of Consent).
9) You did not take testimony under oath from City Inspector William Charles, whose survey report of Sept. 1974 indicated violations by spray crews, including spraying clothing on lines, toys and bikes, and children.
10) No testimony from ANYONE, under oath, attesting to ANY damage from Japanese Beetles.
11) Information was lacking on less expensive alternatives to eradication; i.e., the Fairfax Laboratory who manufacture the Milky Spore disease.
12) No testimony from Mr. Moon, presumably responsible for the activities of Mr. Little, including the illegal use of County Agriculture Dept. employees in telephoning all the nursery owners and growers in the County and threatening them with a quarantine (which they got anyway) if we were successful in getting our elected officials to hear the alternatives to the program – and the question as to whether any need for the program had ever existed in the first place!
13) No testimony or information is indicated from any of the veterinarians at the San Diego Zoo.
14) No independent confirmation of the Depts. of Agriculture contentions that the Japanese Beetles require the equivalent of 10" of rain during the 3 summer months in order to survive (p. 227 of their own Environmental Impact Report). ICU did an independent survey of actual water usage over 1973, of a 2–person family, with gardener–cared–for yard and trees, and

their total water usage (all purposes, including irrigation) do not approach the necessary cubic feet equivalents of the 10" of summer rain. Mr. Little liked to report there was "no problem" with this, since the beetles grow in the Azores, where they have, according to him, 6 – 8" of rain annually. Since they grow pineapple, it seemed unlikely -- a quick check of your friendly encyclopaedia would show the rainfall at between 30 – 60" a year – a far cry from arid San Diego.

15) No testimony is indicated concerning the authorship of the famous May 1 Japanese Beetle Bulletin put out by the City/County/State indicating no health hazards to anything at all. The public deserved better than this, and if your transcripts indicate the authorship, we would like to know who was responsible, because they are legally vulnerable in Federal Court for any such public lying.

16) Of great importance, and apparently ignored in your "investigation" is the invasion of privacy, and the right–to–be–secure sections of the Constitution of the United States. In every instance, the abuse of power and mismanagement and corruption has been excused as being "legal" under the Agricultural Code. We had expected your Grand Jury to provide some answers as to just how much precedence does the Agricultural Code take over the Constitutionally guaranteed rights of the citizens.

17) Finally, no testimony under oath is indicated from Mayor Pete Wilson, Dr. J.B. Askew or City Attorney J. Witt on the affidavits of health hazards submitted by physicians in order to have the helicopter spraying called off. City Attorney Witt should also have testified as to the information given to his office, but not used, in the faint–hearted injunction attempt voted by the City Council, but not effectively pursued, as noted by Judge Froelich in Court.

What you have done is drive another nail in the coffin of the Grand Jury system, which you apparently have forgotten was devised as a method of protecting citizens against willful and corrupt misconduct in office of public officers of every description within the County. In providing a whitewash staement, and given the unfortunate public servant apathy, injustice will grow and feed on itself, and you, as weil as those of us who had placed some faith in the integrity of our Grand Jury system. Apparently the mounting charges of being "rubber stamps" for District Attorneys are legitimate.

What you are doing is narrowly legal, no doubt – we question

whether it is also moral.

[illegible] A. MacLachlan,
[illegible]ecutive Director
[illegible]formed Citizens Union

Virginia W. Taylor,
President ICU

FROM A CROP SPRAYER'S RECORD BOOK

VISCO FLYING COMPANY Applicators of Agricultural Chemicals
714–355–1195 – P.O.Box 68 – Imperial, California 92251

Date	Crop	Canal & Gate	Material
Feb. 27			
AM	Wheat	WSM 83 Tri 11 204	2,4–D
AM	Beets	Pansy 2A	Sulfur
AM	Beets	Tuberose 143	Sulfur
AM	Beets	Thorn 123A	Sulfur
AM	Beets	Trif 2 36	Sulfur
PM	Beets	Trif 3 59	Sulfur
PM	Beets	Trif 3 56	Sulfur
PM	Beets	C West 46	Sulfur
PM	Beets	C West 45	Sulfur
PM	Lettuce	Wormwood 90	Phosdrin
PM	Alfalfa	Ash 143 142	Phosdrin
PM	Alfalfa	Pear 58 90	Phosdrin
PM	Wheat	Malon 5A	Disyston
PM	Onions	B–44 Nect. 36	Mala 8
PM	Lettuce	Trif. 6 118A	Phosdrin
PM	Lettuce	Vail 5A 553	Diazinon
PM	Alfalfa	Trip 5 85	Furadan
PM	Alfalfa	Elder 109	Diazinon
Feb. 28			
AM	Sugar Beets	Acacia 101	Sulfur
AM	Sugar Beets	Alamitos 60	Sulfur
AM	Sugar Beets	Pear 27	Sulfur
AM	Wheat	Date 79	2,4–D
AM	Wheat	Elm 54 Euc. 115	2,4–D
PM	Wheat	Elder 125 126	2,4–D

PM	Sugar Beets	Thorn 38 40	Thimet
AM	Alfalfa	Dogwood 85A	Mala 8
AM	Alfalfa	Plum 3	Phosdrin
AM	Alfalfa	Mesa 3 24	Phosdrin
AM	Alfalfa	Holt 90B	Mala 8 Phos
AM	Alfalfa	Briar 7	Mala 8 Phos
AM	Alfalfa	Birch 3 3A	Mala 8 Phos
PM	Alfalfa	Evergreen 24w24e23NW	Mala 8
PM	Alfalfa	Lotus 17	Mala 8
PM	Wheat	Trif. 2 25	2,4–D
PM	Wheat	Trif. 14 264A	Buctril
PM	Alfalfa	Turnip 156 164 165	Furadan
PM	Alfalfa	Redwood–41	Mala 8
PM	Alfalfa	Thistle 5 28 & 30	Phosdrin
PM	Alfalfa	Trif. 8 160	Diazinon
March 1			
AM	Wheat	Elder 106B	2,4–D
AM	Sugar Beets	Best 110	Thimet
AM	Sugar Beets	F 31A	Thimet
AM	Wheat	Y 6	Thimet
AM	Wheat	Y 10	Thimet
AM	Alfalfa	Newside 26	Diazinon
AM	Alfalfa	Redwood 44	Mala 8 Phos.
AM	Alfalfa	Plum 7	Lannate Phos
AM	Alfalfa	Pampas 2 & 3	Lannate Phos
PM	Alfalfa	Acacia 99	Mala 8
PM	Alfalfa	Acacia 99	Furadan
PM	Wheat	Trif 11–205 206 207	2,4–D
PM	Wheat	Trif 12–222	2,4–D
PM	Alfalfa	Dogwood 1A	Supracide
PM	Wheat	Vail 420	Banvel
PM	Alfalfa	Mesa 3 23	Mala 8 Phos.
PM	Wheat	Trif. 13 248W Trif 14 264 265A	Thimet
PM	Wheat	Dogwood 56B	Systox Trifol
PM	Sugar Beets	Euc. 128 E	Thimet Diazinon Systox
March 3			
PM	Alfalfa	Foxglove 47	Furadan
PM	Lettuce	Best 46	Phosdrin
PM	Alfalfa	Vail 105	Furadan
PM	Wheat	Oxalis 22	Disyston
PM	Wheat	Occident 22E	Disyston
PM	Alfalfa	Newside 30C	Diazinon

PM	Alfalfa	Thistle 7 9 11	Furadan
PM	Alfalfa	WSM 75	Furadan
PM	Wheat	Trif 2 24	2,4–D
AM	Wheat	WSM 14	2,4–D
PM	Wheat	Mayflower 7	2,4–D
PM	Wheat	Pomelo 31	2,4–D
PM	Alfalfa	Ash 68,68A,73,73A,74, 76	Supracide
PM	Alfalfa	Newside 22	Diazinon
PM	Alfalfa	Trif 4 64	Phosdrin
PMN	Alfalfa	Trif 3 255	Phosdrin
March 4			
AM	Beets	Beech 6 6A	Sulfur
AM	Alfalfa	S. Alamo 65 66	Furadan
AM	Alfalfa	S. Alamo 48	Furadan
AM	Alfalfa	S. Alamo 51	Furadan
PM	Alfalfa	Dahlia 6	Mala 8
PM	Alfalfa	Dogwood 7A	Mala 8
PM	Lettuce	Wormwood 76	Phosdrin
PM	Alfalfa	Dahlia 5 7B	Furadan
PM	Alfalfa	Birch 33 So.	Furadan
PM	Alfalfa	All American 25	Furadan
PM	Alfalfa	Redwood 33	Supracide
PM	Alfalfa	So. Alamo 72	Supracide
PM	Alfalfa	Newside 19 21	Furadan
PMN	Alfalfa	Euc. 19 24	Mala 8 Phos.
PMN	Alfalfa	Forgetmenot 2	Mala 8 Phos.
PM	Alfalfa	Euc. 63A	Furadan
PM	Alfalfa	Elder 45G	Furadan
PM	Alfalfa	Peach 25	Diazinon
AM	Alfalfa	Elder 64	Furadan
PM	Alfalfa	Palmetto 21	Phosdrin
PM	Alfalfa	Pear 44	Phosdrin
AM	Lettuce	Wormwood 68	Lannate Phos.
PM	Beets	Thistle 8 3	Meta Systox Phos. Thimet
PM	Alfalfa	Thistle 8 3	Mala 8
PM	Alfalfa	Thistle 8 3	Furadan
PM	Alfalfa	Elm 28 B	Diazinon
March 5			
AM	Wheat	WSM 18B	2,4–D
AM	Wheat	Rockwood 127 128	Disyston
AM	Wheat	Moorhead 185	Disyston
AM	Wheat	Rose 65	Disyston

AM	Wheat	Newside 34	Disyston
AM	Wheat	Lavender 2–4	Disyston
AM	Alfalfa	Pampas 20	Furadan
AM	Alfalfa	Peach 27 28	Mala 8 Phos
AM	Alfalfa	Ash 101A	Mala 8 Phos
AM	Alfalfa	Ash 45B	Furadan
AM	Alfalfa	Ash 39F	Furadan
AM	Alfalfa	EHL Lat. 1 134 135	Furadan
AM	Alfalfa	Mesa 3 84	Furadan
AM	Lettuce	Oat 1	Phosdrin
March 6			
AM	Wheat	Elm 32	2,4–D
AM	Wheat	Wisteria 99	Buctril
AM	Wheat	Plum 33 34	Thimet
AM	Alfalfa	Rubber 19	IPC
AM	Wheat	Trif 8 158	Thimet
AM	Wheat	Trif 9 180BB	Thimet
PM	Wheat	Mesa 5 65	2,4–D
PM	Alfalfa	Newside 22A	Furadan
PM	Lettuce	Lat 5B 167	Phosdrin
PM	Alfalfa	Township 22A	Diazinon
PM	Alfalfa	Township 22A	Diazinon
PM	Alfalfa	Township 22 N & S	Furadan
AM	Alfalfa	Acacia 97 SE	Furadan
AM	Alfalfa	Acacia 96A	Furadan
AM	Alfalfa	Pomelo 36 Pepper 35	Mala 8 Phos.
AM	Alfalfa	Pear 42	Furadan
AM	Alfalfa	Palmetto 33	Furadan Phos
AM	Alfalfa	Palmetto 25 26	Furadan
PM	Alfalfa	Lat. 10 256 157	Supracide
PM	Beets	Peach 31 33	Phos. Thimet
PM	Lettuce	Lat 58 167C	Phosdrin
March 7			
AM	Wheat	Elder 24 25	Disyston
AM	Wheat	Euc. 74C	Disyston
AM	Barley	Thistle Main 40	Thimet
AM	Alfalfa	Ebony 1A 1B	Mala 8 Phos.
AM	Alfalfa	Elm 6 5B	Mala 8
AM	Alfalfa	Lotus 7	Furadan
AM	Alfalfa	Dahlia 4	Furadan
AM	Alfalfa	Newside 23E	Phosdrin
AM	Alfalfa	Thistle Main 38 39	Furadan
AM	Lettuce	Vail 107	Phosdrin
AM	Lettuce	Vail 108	Phosdrin

AM	Alfalfa	Pampas 24 NE	Furadan
AM	Lettuce	Lat. 15 313E	Phosdrin
AM	Alfalfa	Gunterman 68	Lannate Phos.
AM	Alfalfa	Alder 12	Furadan
AM	Alfalfa	Alder 8	Furadan
PM	Cantaloupes	No. Dahlia 75	Lannate
PM	Beets	Euc 128E	Meta Sys. Dia. Thimet
PM	Beets	Euc 132E	Meta Sys Thi. Diazinon
PM	Alfalfa	Wormwood 87	Furadan
PM	Alfalfa	Fig 39	Mala 8
PM	Alfalfa	Foxglove 44 4	Furadan
PM	Wheat	WSM Pump 18 1	Disyston
PM	Wheat	WSM Pump 18	Disyston
PM	Alfalfa	WSM Pump 18 6	Furadan
PM	Alfalfa	WSM Pump 18 4	Furadan
PM	Stonefruit	Acacia 3N	Mala 8
PM	Lettuce	Lat. 5B	Phos. Lannate
PM	Lettuce	Lat 5 169 169/A	Phos.Lannate
PM	Lettuce	Lat. 3 149	Phos. Lannate
PM	Alfalfa	Hemlock 14 16 65	Phos. Lannate
PM	Alfalfa	Hemlock 19	Supracide
PM	Alfalfa	Lat. 1 136	Supracide
PMN	Alfalfa	Euc. 17 18	Mala 8 Phos.
PMN	Alfalfa	Elder 45G	Mala 8 Phos.
PMN	Alfalfa	Elder 82	Mala 8
March 8			
AM	Wheat	Dogwood 74	Diazinon
AM	Wheat	Trif 9 168	Disyston
AM	Lettuce	Vail 305	Phosdrin
AM	Alfalfa	Ohmar 2 3	Phosdrin
AM	Alfalfa	Orchid 5	Phos. Lannate
AM	Lettuce	Acacia 94A	Phosdrin
AM	Wheat	Vail 420	Thimet
AM	Wheat	112	Thimet
AM	Wheat	Trif 13 248E	Thimet
AM	Wheat	Euc.126W	Thimet
PM	Wheat	Elder 23	Disyston
AM	Wheat	Fern 70 N & S	2,4–D
PM	Wheat	WSM 18B	2,4–D
AM	Barley	Foxglove 53	Systox
AM	Wheat	Wormwood 90	Disyston

AM	Alfalfa	Elder 45C	Supracide
PM March 9	Alfalfa	Ash 147 148	Disyston Furadan
AM	Wheat	WSM 13 SE	2,4–D
AM	Wheat	Ash 104	Buctril
AM	Tomato	Sandal 173 174 174A	Diazinon
AM	Lettuce	Vail 305	Phosdrin
AM	Wheat	Date 79	Disyston
AM	Cantaloupes	Dogwood 68S	Phosdrin
AM	Wheat	Pomelo 31	Disyston
AM	Alfalfa	Pampas, 27	Furadan
AM	Alfalfa	Pear 38 30	Lannate Phos

PLANS FOR INTEGRATED PEST CONTROL FOR THE UNITED STATES
By the United States Department of Agriculture

ESTIMATED POTENTIAL MANPOWER REQUIREMENTS FOR INTEGRATED PEST MANAGEMENT

State and region	Total cropland used for crops (1,000 acres)	Field scouts	Professional crop protection specialists
Maine	550	275	19
New Hampshire	152	76	6
Vermont	592	296	20
Massachusetts	212	106	8
Rhode Island	25	13	1
Connecticut	178	89	6
New York	4,417	2,209	148
New Jersey	522	261	19
Pennsylvania	4,421	2,211	148
Delaware	454	227	16
Maryland	1,437	719	48
District of Columbia			
Northeast	*12,960*	*6,480*	*432*
Michigan	5,989	2,995	200
Wisconsin	9,033	4,517	301
Minnesota	17,369	8,085	579
Lake States	*32,391*	*16,196*	*1,080*

Ohio	8,739	4,370	293
Indiana	10,426	5,213	347
Illinois	20,314	10,157	678
Iowa	20,250	10,125	675
Missouri	11,142	5,571	371
Corn Belt	*70,871*	*35,436*	*2,363*
North Dakota	26,633	13,317	888
South Dakota	16,476	8,238	550
Nebraska	19,041	9,521	635
Kansas	26,402	13,201	881
Northern Plains	*88,552*	*44,276*	*2,952*
Virginia	2,649	1,325	89
West Virginia	754	377	26
North Carolina	4,054	2,027	136
Kentucky	3,785	1,893	127
Tennessee	4,101	2,051	137
Appalachian	*15,343*	*7,672*	*512*
South Carolina	2,326	1,163	78
Georgia	4,104	2,052	137
Florida	2,322	1,161	78
Alabama	2,832	1,416	95
Southeast	*11,584*	*5,792*	*387*
Mississippi	4,910	2,455	164
Arkansas	7,023	3,512	234
Louisiana	3,735	1,868	125
Delta	*15,668*	*7,834*	*523*
Oklahoma	9,537	4,769	318
Texas	23,925	11,963	798
Southern Plains	*33,462*	*16,731*	*1,116*

Montana	14,356	7,178	479
Idaho	4,939	2,470	165
Wyoming	2,196	1,098	74
Colorado	9,218	4,609	308
New Mexico	1,430	715	48
Arizona	1,271	636	43
Utah	1,353	677	46
Nevada	539	270	18
Mountain	*35,302*	*17,651*	*1,177*
Washington	7,196	3,598	240
Oregon	3,964	1,982	133
California	8,608	4,304	287
Pacific	*19,768*	*9,884*	*659*
Continental United States	*335,901*	*167,950*	*11,200*
Alaska	14	7	1
Hawaii	179	90	3
Total United States	*336,094*	*168,047*	*11,204*

Based on one field scout per 2,000 acres and one professional crop protection specialist per 30,000 acres. Total may not add due to rounding.

RACHEL CARSON TRUST
for the Living Environmenta, Inc.

8940 Jones Mill Road
Washington, D.C. 20015
Area Code 301–652-1877

FEDERAL REGULATION OF PESTICIDES 1910–1975

This summary is based on studies by John E. Blodgett, Harrison Wellford, and Roland C. Clement, with thanks to these authors

1910 -- The First U.S. Federal pesticide act was passed 65 years ago to protect farmers from fraudulent, ineffectual and misbranded compounts. The law was placed under the administration of the US Department of Agriculture. It was based on post–market control; if fraud was discovered the product could be taken off the market. This came at the end of a sequence of consumer protection legislation begun about 1900 to protect the public from medical quackery and gross abuses in food processing. These laws brought to a close the era of medicine shows and itinerant hawkers who often sold worthless or dangerous products, particularly in farm communities.

1946 -- The National Audubon Society was the first national conservation organization to warn of the environmental hazards involved in the massive use of DDT, the new synthetic pesticide, i.e., in aerial applications covering widespread areas.

1947 -- The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) replaced the 1910 legislation. Administration of the law continued under USDA. The new law was passed in response to the need for regulation of the large number of synthetic organic pesticides, many of them developed during World War II, which were coming onto the market in a flood of new products vigorously pushed for use in unprecedented quantities. FIFRA, like the 1910 Act, was designed to protect the farmer from material that might be either dangerous or not effective as advertised. No controls over the *use* of pesticides were included. Registration of the label with the USDA was required before sale was permitted. The law required that the product be safe when used as directed, which had to be stated on the label. A loophole provision for "protest registration" allowed a manufacturer to market a product even if the USDA refused to register it. This constituted a pressure against stringent administration by USDA. Only 17 pesticides were marketed under "protest registration." FIFRA was basically a labelling act. It provided no sanctions against misuse of a pesticide, no authority for

immediate stop–sale orders against a dangerous pesticide, and only feeble penalties for companies selling pesticides in violation of safety criteria.

1947–1969 -- The record of the Department of Agriculture in enforcement of the law reflected the agency's bias as the government's most enthusiastic promoter of pesticides. The Pesticide Regulation Division (PRD) of USDA was little inclined toward ecological thinking. PRD had the power to recall dangerous products from the market from 1947 onward but did not exercise this power until 1967. It did not set up a formal procedure for the recall of faulty products until May 5, 1969, two days before scheduled GAO hearings into PRD operations were scheduled. Only once in 22 years did PRD initiate criminal proceedings against violators of the pesticide laws, although in that period, pesticide accidents involving human beings rose to 50,000 annually. PRD investigated fewer than 60 accidents involving people and about twice as many incidents involving farm animals. During the years from 1947 to 1969 PRD regularly approved pesticides, over the objections of the Food and Drug Administration and the Public Health Service, which later had to be restricted. These included mercury–treated seeds, alkylmercury compounds, use of no–pest strips around infants, the aged, and in food areas, and compounds which caused cancer in test animals.

1957 -- The Pesticide Research Act provided funds for research in the Department of Interior. Since 1946 the Fish and Wildlife Service had been doing critical research on the effects of pesticides in the environment with totally inadequate staff and funds. This Act enabled it to expand this research. The effects on fish, birds, and mammals, observed by wildlife biologists, gave us our first warnings of the overall hazards of pesticides.

1959 -- The first concerted opposition to USDA pesticides programs developed when all the major conservation organizations joined in opposing the fire ant eradication program in the southeastern U.S. USDA continued the program at "control" level and gradually the most dangerous of the pesticides used, heptachlor, was superseded by mirex.

1960 -- By this year it was known that DDT was causing serious damage to the whole environment.

1962 -- The appearance of Rachel Carson's SILENT SPRING initiated a series of events which were to culminate in 1970 with the

creation of the Environmental Protection Agency and, in 1972, the complete restructuring of Federal pesticide regulation. "Rachel Carson contended that pesticides were being used excessively and without proper regard for their possible harmful effects on fish and wildlife or humans. She did not say, as her critics often allege, that pesticides should be eliminated or banned. She said ignorance of possible consequences should not be a license for promiscuous use and that more research and understanding were needed about the effects of pesticides before they should be used as permitted and advocated by USDA." (Blodgett)

The impact of SILENT SPRING led to the formation of pesticide review and control boards and committees at state and federal levels, and the production of extensive reports by the President's Science Advisory Committee under both Presidents Kennedy and Johnson. The 1963 PSAC report agreed with Rachel Carson's main concerns and made several forceful recommendations. No action was taken in this regard by USDA under the pesticide regulation act.

1964 -- An amendment of FIFRA directly associated with Rachel Carson's book closed the loop-hole allowing "protest registration" of products after denial of registration by USDA. The Presidential Science Advisory Committee Study called USE OF PESTICIDES made specific recommendations for further legislation.

1967 -- 1968 -- The General Accounting Office published two studies in 1967 and 1968 which indicated unresponsiveness on the part of the USDA to criticisms of its registrations, particularly from the Food and Drug Administration and the Public Health Service. It was shown that the USDA had continued the registration of some products after years of repeated protests. The government Operations Committee in the House of Representatives came to the same conclusion. The USDA had not once filed suit against any violation of the Act.

1968 -- The Environmental Defense Fund filed suit against both USDA and HEW on the grounds that pesticides were being registered contrary to the registration procedures set up by FIFRA. This referred to products which, when used as directed, were not safe for man.

1969 -- Secretary of HEW Finch commissioned a study on pesticides and their relationship to environmental health. The report concluded that the US Department of Interior, which has responsibility for

fish and wildlife and the HEW which has responsibility for human health, should be given a greater role in pesticide registration procedures.

1969 -- By this year several scientific reports firmly implicated DDT as a causative agent of cancerous growths in test animals. On November 12, 1969 Secretary Finch of HEW asked the Departments of Agriculture and Interior to join him in "phasing out" the use of DDT within two years.

1970 -- The Environmental Protection Agency was established on December 2, 1970. Offices from several Federal agencies were incorporated in it, including the Pesticide Registration Division from USDA.

1971 -- William D. Ruckelshaus, Administrator of EPA, cancelled all but a few minor registrations of DDT on June 14, 1971, thus announcing a virtual ban on this chemical in the U.S. effective December 31, 1972. The chasm between public promises and official performance on DDT is deep and little known to the public because official press notices in response to public clamor gave a contrary impression. The cancellation proceedings were protracted for more than 5 years, in which time the manufacture and major use of DDT, on cotton, were allowed to continue. "As the first of a long series of synthetic chemical insecticides introduced into general use by industry, with the USDA approval, after World War II, DDT is a classic example of technology outrunning the science supposed to protect us from the misapplications of technical know-how." (Clements) The importance of DDT became symbolic as a test of the rights of the marketplace in relation to the public health and environmental interest.

1972 -- The Federal Environmental Pesticide Control Act (FEPCA) was adopted. This Act for the first time explicitly recognized the environment as a quality to be protected, permitted the regulation of the use of pesticides, and their classification as either general or restricted use pesticides. The latter could only be used by persons certified or working under the supervision of a certified applicator. Certain qualifications for certification were set into the law. It provided for more streamlined cancellation procedures. A major improvement was establishment of the principle that in a contested case, it is the responsibility of the manufacturer to prove a product's safety, instead of putting the burden of proof of hazard on EPA,

citizens's groups, and the public. The Act needed to be reauthorized after three years.

FEPCA has extended Federal control over pesticides marketed within a state as well as those which move in interstate commerce. It gave EPA authority to do expanded research and monitoring in order to find ways to reduce dangers of human exposure to pesticide residues. New civil and criminal penalties were established for violations. FEPCA has defects but contains useful provisions. This important legislation, so long in the making, should not be dismantled or eroded by piecemeal diminishing amendments.

FEPCA explicitly recognizes the environment as a public value to be protected. It interestingly represents a confluence of four streams of progress in U.S. social legislation: 1) it began with protection of the farmer; 2) attention was drawn to the consumer health aspect under the Food, Drug, and Cosmetic Acts; 3) with more difficulty, recognition was won for the environmental right; 4) farmworkers' protection entered the picture, first through the Occupational Safety and Health Administration and later under the Occupational Safety and Health Act. Three of these areas of concern -- the agricultural, the environmental, and farmworkers' health are now receiving protection through FEPCA. Consumer health remains a divided responsibility between FEPCA and the legislative jurisdiction of the Food, Drug and Cosmetic Act.

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ABOUT THE AUTHOR

Laura Tallian has spent a lifetime in agricultural politics. As a beekeeper's wife in the Imperial Valley of California, she watched a bee business of 6,000 colonies menaced by pesticides. Increasing industry problems caused her to go frequently to Sacramento and Washington, D.C. In Imperial Valley she saw take form the first legislation to regulate pesticides, and watched early success under the late B. A. Harrigan, agricultural commissioner. Then came increasing toxicity and number of pesticides, dominance of oil–pesticide companies, and evasion of enforcement by state agencies. From 1927 to 1960, when the bees were sold, she participated in various incidents marking these developments.

Her family engaged in farming as well, and in 1955 she donated twenty acres of alfalfa to University of California, so that Dr. Robert van den Bosch could introduce parasites of the spotted aphid and spread them successfully to control the pest. Later she went to Hawaii to study the success of Hawaiian sugar planters in entomology.

After graduating from University of Oregon, she taught in the high school in Calexico, California, from 1925 to 1959, and then retired to live near San Diego.

For the last five years she has been a volunteer worker for People's Lobby, participating in two statewide signature drives to qualify initiatives and in the political activities of that organization.

She is the author of *The Pesticide Jungle.*

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